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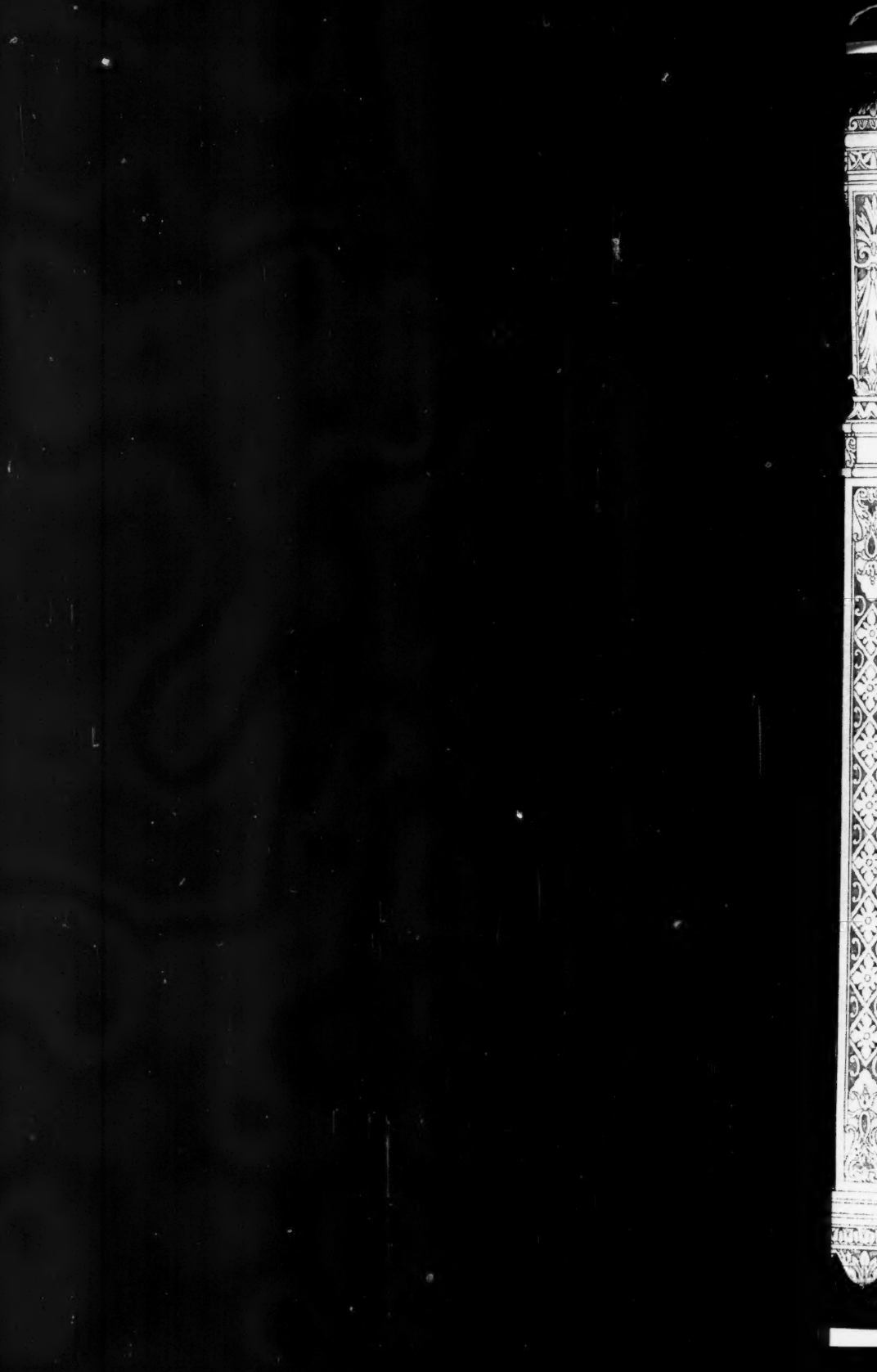

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JANUARY

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION

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Dentofacial Deformities—*Lischer*
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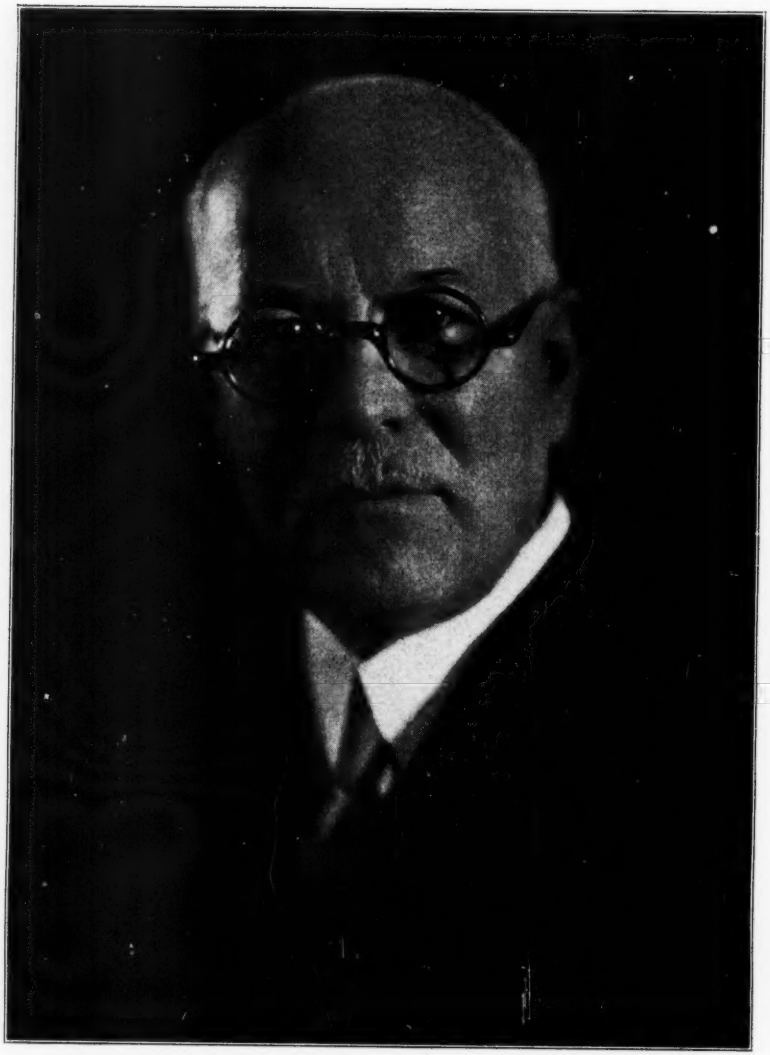

WILLIAM RICE, D.D.S., D.M.D.
(1867-1932)

UNIV. OF MICH.

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Original Communications

MALIGNANT AND OTHER GROWTHS ABOUT THE MOUTH*

By CHALMERS J. LYONS, D.D.Sc., Ann Arbor, Mich.

BY virtue of its education and training, the dental profession has assumed the entire guardianship of the mouth and dependent tissues. This responsibility has been conceded to dentistry not only by medicine but by the public as well. Quoting from Charles H. Mayo[1]:

> The modern dentist in practice concerns and should concern himself not only with the teeth, but also with the jaws and the whole oral cavity. Local lesions in the oral cavity may be the cause, the effect or the sign of local systemic or organic disease anywhere in the body, and some organic systemic or local diseases may and do produce various signs in the oral cavity. Consequently, the dentist who looks into a patient's mouth will miss something of vital importance to his patient if he sees only teeth.

Today, the field of dentistry must embrace not only the care of the teeth, but also the recognition, diagnosis, and treatment of many of the lesions occurring in the oral cavity. Entirely too often, the dental examination confines itself only to the teeth, and frequently more important conditions pertaining to the welfare of the patient are overlooked. I wish I might impress on the dentist the necessity for him to think in terms of the patient's welfare rather than in terms of teeth. Dentistry should meet its responsibility in fullest measure as regards malignant and other growths about the mouth which the dentist frequently sees before the physician does, as the early recognition of these conditions is important for the future welfare and happiness of the patient.

*Read before the Section on Oral Surgery, Exodontia and Anesthesia at the Seventy-Fourth Annual Session of the American Dental Association, Buffalo, N. Y., Sept. 14, 1932.

1. Mayo, C.: Interdependence of Medicine and Dentistry, J.A.D.A., 15:2011 (Nov.) 1928.

Mills, an English surgeon, presents one of the best definitions for the term "tumor" that we have had. He says[2]: "A tumor is a new growth of tissue or cells arising without known cause and continuing to grow on its own account without regard to the growth or nourishment of the individual in which it is forming. It serves no useful purpose and comes to no physiologic termination."

With this definition in mind, the benign and malignant growths which concern us in this paper will be distinguished from chronic inflammation and simple hypertrophy. We will consider those pathologic growths which, under certain conditions, clinically simulate tumors; i.e., those conditions which result in the formation of a localized collection of fluid surrounded by a definite wall or membrane known as cysts.

Chronic inflammation and hypertrophy arise from a known cause and come to a physiologic termination. In the case of cysts, there is no new growth of tissue or cells in the masses themselves, but a growth of cells surrounding them. A tumor has a distinctive characteristic in that the cells which go to make up the growth possess a life of their own regardless of the health or nourishment of their host.

At the present time, little is known as to why these growths occur. There seem to be certain predisposing conditions which are partly accountable for them. Some of these cellular growths occur at certain periods of life, but most of them may occur at any age. There was a time when it was thought that there was a so-called "cancer age," which was set at from 35 years on, but we are all finding carcinoma in much younger groups and it may now be stated that no age is immune from cancer. I believe that heredity plays a very important part in the causation of all of these cellular growths; and not only that, but its influence on cyst formation is an important one. Injury and chronic irritation also play their part in the causation of these growths, but more or less indirectly. I am of the opinion that neither injury nor chronic irritation alone is responsible for the beginning of these growths, but, coupled with a predisposition toward them, these two may be important factors. Just what the nature of the predisposing condition is must be ascertained by further study, and it is to be hoped that many years may not elapse before much light will be cast on this great problem.

Frequently, the location of these growths and the tissues from which they arise are quite an aid in the determination of their character. Probably the best scientific classification of these growths is to be found in the Codman registry. From the clinical standpoint, I like to consider these growths in the mouth in regard to the tissues from which they arise, the location, the history of the growth, the jaw involved, the possibility of trauma, associated conditions of pain, discomfort and deformity and the presence or absence of cervical lymphadenitis.

The first of these lesions which we shall consider will be the different types of cysts which have their origin in the oral cavity. The mucous cyst, which is found in the mouth in the site of the mucous glands, should be enucleated with the lining. The dermoid cyst may be found on the cheek or in the

2. Mills, G. P., and Humphreys, H.: Text Book of Surgery for Dental Students, London: Edward Arnold and Co., 1919, p. 87.

floor of the mouth, and complete enucleation by blunt dissection is also indicated here.

The ranula, which is likewise found in the floor of the mouth, is a swelling that has been confusing to both surgeons and writers. Its exact etiology is rather obscure. It has been described by many authors as resulting from the occlusion of the ducts of the sublingual or submaxillary glands from the presence of calculi or some foreign body that sets up an inflammatory process. I have not observed a single case in which these ducts were involved. It is my opinion that the ranula should be considered as a cyst, and it is logical to assume that its etiology can be based on the same premises as that of other better known cysts of the body.

I believe that cystic conditions occur in the body because of the presence of so-called embryonic rests, which, coupled with an irritation, under certain conditions permit them to develop. On account of the ranula's being confused with the occlusion of the ducts of the submaxillary and sublingual glands, it was natural to assume that the treatment should consist of draining the ranula and reducing the inflammation around the ducts. Many devices were used for this purpose. Silver tubes, perforated and in the shape of a ring, were inserted in the walls of the ranula so that the contents could be evacuated through the perforations. A gauze wick, inserted through the walls of the ranula for the purpose of draining, was employed by some operators, while others opened the ranula wide to make occlusion of the wound more difficult and drainage of the ranula easier.

The only logical way that the ranula can be handled successfully is to recognize the lesion as a cyst and treat it as such. This is not a difficult operation. The mucous membrane immediately above the cyst is incised and, by blunt dissection, the cystic lining and contents are dissected out. In many of these cases, it is not necessary to suture following the operation as the pliable tissues in the floor of the mouth collapse the wound and repair takes place without untoward incident.

We will now discuss those cystic growths, or tumors, of the jaws derived from the special cells, some of which are concerned in tooth development. They may be divided into four groups: (1) the median maxillary cyst; (2) the dental root or radicular cyst; (3) the dentigerous or follicular cyst, and (4) the adamantinoma or multilocular cyst.

The first or median maxillary cyst does not appear to be associated with tooth development. This cyst, first described by A. W. Meyer,[3] professor of anatomy in Leland Stanford University, is one that has been frequently overlooked. I believe these cysts to be more common than we have thought, because, from roentgenographic evidence, they may easily be mistaken for the anterior palatine fossae. They are not infectious in origin and are not related to the roots of the central incisor teeth. Their location is the intermaxillary suture line of the maxillary bone, about 2 cm. distally from the gingivae of the central incisor teeth. They are undoubtedly congenital. In size, they vary from 3 or 4 to 15 mm. and are either round or oblong. Dr. Meyer, whose work has all been on cadavers, states that the incidence of these cysts in 566 bodies was one in seven. He states:

The thin walls of these cysts could be de-

3. Meyer, A. W.: Hitherto Unrecognized Median Maxillary Cysts, Pacific Dental Gaz. 39:242 (April) 1931.

tached easily from surrounding bone, which was very thin in places but never bulged, indicating that the pressure within could not have been large, although it was sufficient to cause increase in the size of the cavity through bone absorption during the period of its growth. The cyst wall was composed of fibrous connective tissue lined in whole or in part by a single layer of epithelium. In a few places, there was some indication suggesting squamous epithelium.

I have operated in a number of these median maxillary cysts and have found approximately the same condition as Dr. Meyer has found in the cadaver. These growths should be removed for they are predisposed to infection. In practically all patients that I have operated on, they have previously become infected. The only danger in their removal is in the invasion of the anterior palatine canal, which is in close anatomic relation to the site of these cysts. An incision through the mucous membrane should be made immediately over the area occupied by the cyst and the cystic wall exposed. Then, by blunt dissection, the cyst should be enucleated. Usually, these cysts are not very deep, and we have had good results by simply approximating the flaps of mucous membrane and suturing. The cavity is filled in with granulation tissue and repair usually takes place without untoward incident.

One of the most common cysts that occur in the jaws is the dental root cyst, or what is sometimes called the simple or radicular cyst. These cysts usually begin with a periapical granuloma. Under certain conditions that seem to be obscure and in certain persons with a predisposition to cystic growths, they have a tendency to develop. Development is slow and without pain or discomfort to the patient. Bunting states[4]:

Dental root cysts develop from periapical granulomata of long standing. A dense connective tissue is formed about the periphery of the granulomatous area which tends to shut off the blood supply of the granulation tissue. Degenerative processes follow in certain areas of the granuloma. Wherever these occur the epithelium proliferates to surround and to encapsulate these foci. Further degeneration and liquefaction follow producing a cystic cavity in the center of the granuloma about which is formed a dense fibrous wall.

The process of degeneration continues, the cavity becomes distended and the bone resorbs under the pressure exerted by the liquefaction process until a large area of bone is destroyed. The character of the cystic fluid varies in accordance with the time in which it is forming, and will vary also from an amber to a dark brown. The fluid contains dead epithelial cells and crystals of cholesterin.

These cysts are lined with a membrane of squamous or cylindrical epithelial cells which are outgrowths of epithelial elements in the peridental membrane. The rapidity of development of these growths is influenced in a measure by the character of the surrounding osseous tissue. In the maxillae, the development is more rapid than in the mandible and, on account of the character of these two bones, there is a tendency to greater growth in the maxillae without inconvenience to the patient.

These growths frequently involve the maxillary sinus in their development and may completely obliterate it.[5] Their development is chronic and they grow continually, slowly and without pain. There are usually no signs nor symptoms

4. Bunting, R. W.: Oral Pathology, Philadelphia: Lea and Febiger, 1929, p. 460.

5. Berger, Adolph: Principles and Technique of Oral Surgery, New York City: Dental Items of Interest Publishing Company, 1928.

present in the early stages. In the later stages, the cyst may cause pressure on a sensitive nerve and the patient may complain of discomfort. The cyst may develop to such an extent that a change in the facial contour is noticeable. At this time, palpation of the outer walls will convey the sensation of palpating parchment; that is, it gives a crackling sensation.[6]

They may become infected either by rupturing or by surgical interference through an error in diagnosis. The surgeon, assuming the cyst to be an abscess, opens it for the purpose of establishing drainage. In such cases, there may be symptoms of infection present and pain may be associated with the cyst. These cysts are filled with a fluid which varies in color and consistency, this depending on the tissues in which it is forming and the length of time that it has been developing. The color variation is from a light amber to a dark brown. The aspiration of this fluid is a very important factor in a differential diagnosis. One of the best diagnostic factors is the roentgen-ray evidence. The plate will reveal a clear-cut circumscribed cavity, showing very definitely the destruction of bone.

From the pathologic standpoint, the dentigerous or follicular cyst closely resembles the dental root cyst. It differs from them in etiologic factors only. This cyst always forms around unerupted developing teeth or tooth follicles, and these teeth are usually imperfectly formed. Usually, it forms about the time that the tooth should erupt. The malformed tooth is usually attached to some point in the wall of the cyst and sometimes buried in it. The cystic contents are similar to those of the dental root cyst and the effect from the resorption of the osseous tissues is the same. The removal of these types of cysts is indicated. The roentgen rays reveal a well-defined cavity in the bone. The history of the growth will reveal that it has been getting larger over a comparatively long time, and this development has been without symptoms. On palpation, a crepitus-like feeling is observed. On aspiration, an amber or brown fluid is obtained.

In the differential diagnosis, there are two other conditions that must be considered. First is the acute abscess with edema of the tissues. The distinction between the cyst and the abscess may be found in the length of time that the edema has been present and the presence or absence of pain. In the acute abscess, we would expect the edematous condition to occur over a period of from twenty-four to forty-eight hours, while, with the cyst, the patient may give a history of swelling covering a period of several weeks. With the abscess, there would be the history of intense pain; while, with the cyst, development has occurred painlessly.

Secondly, the sarcoma may clinically simulate the cyst. Development may occur similarly to that of the cyst, that is, by a slow progressive growth without pain or inconvenience to the patient. The diagnosis may be made by an attempt at aspiration or by the roentgen rays. The roentgenograms of the sarcoma will show irregular hazy trabeculae of bone, usually of greater density than the surrounding tissue, while the cyst will appear on the plates as a sharply outlined cavity in the bone.

The treatment of these cysts must be surgical. There are two methods by which they may be removed. One is by cutting away the outer plate of bone and

6. Lyons, C. J.: Cysts and Tumors in the Oral Cavity, J.A.D.A., 11:1098 (Nov.) 1924.

the outer wall of the cyst and then suturing the normal mucous membrane to the cystic membrane. This is known as the Partsch method. I use this method only in the case of those large cysts of the maxillae when the antral or nasal cavities are involved, in which case I leave the cystic membrane to separate these cavities from the mouth. Many operators prefer the Partsch method for all of these cysts. In my hands, I feel that less postoperative deformity and a greater amount of bone regeneration result if I remove the entire cystic wall and pack the cavity with iodoform gauze until granulation tissue begins to form over the floor of the cavity, at which time the gauze dressing may be left out.

The multilocular cysts or adamantinomas are not so common as the other types of cysts. They are considered benign growths but locally malignant; that is, if any of the cystic material is left at the time of operation, they will recur. They do not metastasize; and they occur more frequently in the female than in the male and more frequently at the angle of the jaws than at any other site. In fact, in more than thirty of these cases that I have observed all have been in the female and all at the angle of the jaw.

The etiology of these growths is not very clear. Their histologic structure shows that they are derived from the enamel organ. Malassez,[7] in 1885, described these growths as springing from the embryonic epithelial rest, which, under certain conditions, were activated to proliferation. In their clinical course, their growth is a slow one. They develop without symptoms until a sensitive nerve is encroached on or they become infected. The cyst cavities of the tumor may be individual or communicate one with another by small channels. The contents of these cystic cavities are similar to those found in the other types of cysts.

Berger[8] states: "The multilocular cysts are found to be the least malignant of epithelial growths of the jaws and ordinarily do not metastasize. They are regarded as benign growths but have a tendency to malignant degeneration." Complete extirpation of these growths is indicated.

Of all the growths in the mouth, probably one of the most common is the papilloma. It is the least complex of all the mouth tumors. It is benign and may be likened to the wart on the epidermis. This term is loosely employed to include any growth on the skin or mucous membrane based upon or resembling a normal papilla. In the mouth, it is usually made up of fibrous connective tissue and is found arising from the gum edges or tip of the tongue, the side of the cheek, the azygos uvula and the pillars of the fauces. Growth is slow and causes little disturbance until the lesion becomes irritated. When papillomas occur on the cheek or tongue, they are easily irritated by the teeth and their growth becomes more rapid. Their complete removal with the cautery is indicated.

The epulis, a giant-cell growth, is a most common mouth tumor, arising from the peridental membrane or periosteum. It is a border line tumor and of slow growth at first, but growth will become more rapid on irritation. Bloodgood[9] states: "They lie between inflammation on the one hand, and a neoplasm on the other. They stand between the really benign, slightly malig-

7. Quoted by Bunting, R. W. (Footnote 4).

8. Footnote 5, p. 247.

9. Bloodgood, J. C.: System of Surgery (edited by Bryant and Buck), Baltimore: William Wood and Co., 1909, p. 813.

nant and the malignant connective tissue tumors." These are giant-cell tumors, occurring most frequently in children and young adults. Pregnancy seems to aggravate these tumors and their growth is more rapid at this time.

The identification of these growths is not difficult as they arise from the periosteum by a single stalk and grow in the shape of a mushroom. The pressure of the lip or cheek will flatten them out so that they spread out over the teeth. They are usually quite vascular and bleed easily when touched. The importance of early treatment cannot be overestimated. Quite a radical operation is indicated. Where the growth is extending out between two teeth, the teeth should be extracted, the growth removed, and, after the alveolar process is cut away, until the base of the tumor is reached, the whole area should be cauterized with the actual cautery. It is my experience in handling these growths that the treatment had better be too radical rather than too conservative. If they recur, the growth is much more rapid and the approach to malignancy much closer.

Other tumors arising from the periosteum may be composed of sarcomatous tissue, with large amounts of fibrous, cartilaginous, myxomatous or osseous tissue within them, and are clinically spoken of as mixed tumors. They are the least malignant of the sarcomatous group. They have their site in the body of the bone pushing inward from the periosteum. They have rather definite boundaries with smooth surfaces on which the skin is intact and normal in color. These growths are slow and without symptoms. The treatment consists of complete extirpation by surgical means followed by heavy cauterization. If the growth recurs after the operation, it is likely to be more malignant than it was originally, for, in the recurrence, there are more of the sarcomatous elements and less of the original elements making up the recurrent tumor. In my own experience, these tumors have appeared more often in the maxilla than in the mandible.

We will now discuss briefly the dentists' responsibility in some of the malignant growths which occur all too frequently in the mouth. These tumors are broadly classified under two heads; the sarcoma and the carcinoma. Pusey[10] says:

> The sarcoma represents a new growth of embryonic connective tissue. It is prone to form metastasis by way of the blood vessels, resulting in the spread of secondary growths. They are composed of round, spindle or giant cells with a minimum amount of connective tissue or intercellular substance and they have a very rich blood supply.

The epidermis or mucous membrane over the growths may be normal or the sarcomatous cells may destroy the epithelium. These growths usually develop without pain, and, if they are of a central or medullary type, they may become far advanced in their development without the patient's knowledge. They may occur in the young as well as in the old, and there seems to be no time of election for them to occur.

In the young, the periosteal sarcoma in the mouth is one of the most vicious lesions of all the mouth tumors. Its growth is extremely rapid and the prognosis very unfavorable. Most of these lesions are inoperable when first identified.

Another very malignant type is the melanotic sarcoma. It also grows rapidly and metastasizes. The lymph glands

10. Pusey, W. A.: Principles and Practice of Dermatology, New York City: Appleton and Company, 1924.

are early involved and metastasis to distant parts is rapid. Fortunately, this type of the sarcoma is comparatively rare.

In the sarcoma, the smaller the cell and the greater the vascularity, the more malignant the tumor is likely to be. The giant-cell and the spindle-cell sarcomas are of slower growth and less malignant than the round-cell sarcoma, which is of rapid growth, very vascular and very malignant.

Prognosis in the round-cell variety of sarcoma is not good unless an operation is performed very early. Treatment consists of radical excision of all the involved tissues well into healthy structures. A microscopic examination of the tumor should be made in every case after the growth has been removed to determine its type and degree of virulence. In every instance, I follow operation in these cases with deep roentgen-ray therapy or radium. The efficiency of this treatment is still problematic, but it seems to be the best we have at the present time. These cases should be reexamined periodically for recurrent or secondary growths.

The last group of malignant growths which we will discuss is the epithelioma or carcinoma. There are two distinct types of this tumor found in and about the jaws: (1) the basal-cell, or the superficial or rodent ulcer type; and (2) the squamous cell or the lobular or nodular type. In the first, or the basal-cell type, the growth extends superficially rather than deeply. Pusey offers as a possible explanation for the characteristic behavior of these growths the fact that the lesion appears typically when the tissues are thin and when the lymphatics tend to pursue a superficial course parallel to the surface. These lesions are frequently observed on the mucous membrane of the lips and cheeks. The prognosis of this type of epithelioma is favorable if it is recognized early.

The squamous-cell type is more vicious, consisting of a downward and lateral growth of epithelial cells into the underlying connective tissue. The growth consists of large finger-like masses or lobules which branch and fuse with adjacent masses to enclose areas of connective tissue. These wild growths may occur on the lips, tongue, palate and cheeks or in the nasal or antral cavities as well as in other parts of the body. In the mouth, they may be primary or secondary. These lesions in the mouth rarely occur before 30 or 35 years of age and invariably appear in unclean mouths. The source of these growths is still obscure. One of the factors is some form of irritation to the tissues in which they arise. Another great factor is susceptibility to these growths. Let me repeat that just what constitutes susceptibility is not clear, but there is abundant evidence that heredity plays an important part. Just what part syphilis plays in epithelioma is another interesting consideration. Jonathan Hutchinson states that 40 per cent of carcinomas can be traced to former syphilitic lesions. It is not clear whether a syphilitic lesion is a factor *per se* or whether the irritation which it produces is a factor. We all know that, in the mouth, ill-fitting dentures, roughened and broken-down tooth roots, sharp edges of teeth, etc., provide an irritation that may encourage the development of these growths. In patients over 35 years of age, the dentist should look with considerable concern on any irritation to the mucous membrane of the mouth, for it may be a source from which carcinomas may easily spring. The successful treatment of these malig-

nant growths of the mouth is dependent entirely on a correct early diagnosis.

Frequently, these growths are not easy to diagnose. Biopsy is the only sure method of identification. A small section should be removed, including both the normal and the abnormal tissue in the section. I always follow the taking of biopsy material by cauterization of the incised surfaces in order to prevent spreading of the tumor through the blood stream.

Carcinoma is more frequently found in the oral cavity than is sarcoma, the ratio being about three to two. It is more common in men than in women. It occurs usually at a later period of life than does sarcoma. These tumors seem to flourish between the ages of 35 and 60, while sarcoma selects youth and middle life in which to develop. Sarcoma involves the body of the bone, while carcinoma involves the jaw first along the alveolar borders. Cysts, abscesses and gumma should be ruled out in making a differential diagnosis. Radium and deep roentgen-ray therapy, following the surgical procedure, sometimes yield good results, but they are not indicated when bone is involved.

The dentist should look on any irritation of the tongue or mucous membrane with considerable concern for it may be a source from which these malignancies may easily spring. The dentist usually sees these lesions before the physician does, for they usually give little discomfort in their incipiency. By the time the patient seeks the aid of the physician on account of discomfort, they are usually so far advanced in their development that the probability of successful treatment is greatly reduced. In making his mouth examinations, it should be the routine policy for the dentist to examine the mucous membranes of the mouth as well as the teeth, not overlooking the surfaces of the tongue, and when an abnormal area cannot be accounted for by dental disorders, he should look on that area with grave suspicion and follow up the case until the area in question is identified. The physician and the public are looking to dentistry to help reduce the mortality of cancer of the mouth.

DISCUSSION

A. L. Frew, Dallas, Texas: The closer our contact with the medical profession, the more we are brought to realize that some members of the medical profession are not entirely conversant with all conditions that are found in the mouth. For that reason, when rendering a diagnosis, we should make a thorough examination of all parts of the oral cavity. In an examination, if there are found in the tissues any lesions or unusual conditions which have been present for three or more weeks, they should be very carefully investigated and the patient kept under observation. Generally, any lesion that has been present for three weeks is bordering on the danger line. In addition to the various methods of draining a ranula, I use a small soft rubber tube cut to a length that will reach from the bicuspids on one side to the bicuspids on the other side of the floor of the mouth. This tube is well perforated. Two openings are made through the cyst and the tube is passed through these openings and ligated to the teeth on either side; which allows the contents of the cyst to pass through the perforations and cut through the ends of the tube. I was somewhat surprised at the frequency of median maxillary cyst as described by Dr. Meyer, i.e., one in every seven cases examined. Perhaps some of the unusually large nasopalatine foramina that I have seen in the roentgenogram have been median maxillary cysts. In describing epulis and the method of removal, Dr. Lyons mentions only the well-known vascular type. The other type known as fibrous epulis has been more common in my practice. This type of epulis is of slow growth and is nonmalignant. It occurs in the same tissues as vascular epulis and should undergo the same radical removal. In a consideration of the various dangerous growths that appear in the mouth, leuko-

plakia should not be overlooked. In its early stages, leukoplakia is easily eliminated by removal of the exciting causes, but when well-advanced, surgical procedure is difficult because of extensive involvement of the tissues.

T. A. Hardgrove, Fond du Lac, Wis.: Dr. Lyons' paper reflects his conclusions in the field of oral surgery and pathology after many years of experience. Many years ago, Dr. Logan, of Chicago, said that the right to supervise the field of dentistry was dependent entirely on knowledge to do so properly, and, about the same time, the late Dr. Barrett, of Buffalo, said that when the field supervised by the oral surgeon and dentist seems to be limited, it could be enlarged by the ability to take over the adjacent field. Dr. Lyons now tells us that the public is demanding that the dental profession supervise this field because we are qualified to do it better than those who have not had the training; and that medicine looks to us for the supervision of this field. We must, he states, not confine our diagnostic and supervisory efforts to the teeth alone but must recognize, diagnose and treat lesions occurring in the oral cavity. This places the supervision of the oral cavity almost entirely in our hands; but it demands something more than that. In order to diagnose and treat lesions of the oral cavity and conditions resultant in the tissues of the body, we must be able to recognize and diagnose diseases any place in the human body. Not that we should treat them all, but our training should be so extensive that we can recognize their significance in connection with oral conditions which may be the result or cause of these remote lesions, diseases and disturbances. Dr. Lyons refers to Dr. Mills' definition of a tumor. It is extensive, elaborate and expressive. Definitions should be simple and explicit for the reason that a definition of today may be obsolete when more knowledge is gained of the subject matter it attempts to describe. To recognize the dividing line between chronic inflammation and simple hypertrophy is not always so easy, nor should these conditions be passed on too lightly at all times. What I mean to say is that a simple hypertrophy or chronic inflammation may be the beginning of malignancy. To describe a tumor by simply saying that it is an excessive growth of cells without any physiologic purpose is, I believe, safe. Cysts, of course, may simulate a tumor. In the picture of a cyst, we have elaborations of cells both connective and epithelial in the wall of the cyst. The contents of some cysts, if it is fluid, are said by some to be physiologic. If we understood the influence and the chemistry of the fluid within the cyst itself, we might understand better why a cyst occurs. If it were physiologic, it would seem that it could be absorbed. But it does not absorb. There are those (Dr. Quigley) who believe that epiblastic rests are activated to tumor formation by the presence of infection in the system, and that may be an initial cause for the simple cyst that is filled with fluid. Just why tumors occur, of course, is not entirely understood. There are many theories advanced. The one more recent and the one extreme effort is being put forth to establish is the question of vitamin influence when the cellular control has been lost and, in the presence of infection, resting cells of an embryonic character or misplaced cells are activated to the point where tumor formation results. It may be that embryonic cells are held in control up to a certain age in certain individuals, and then, in a readjustment of the endocrine influence, in its effort to maintain or establish a balance for the individual, the influence which controls the growth of cells has been disturbed or lost and these tumors occur as a result. It looks as though there were a controlling influence, as there is a controlling influence on the normal cell, since we have tumors of distinct types. Dr. Lyons is right when he says that heredity plays a part in the causation of the cellular growth. Individuals inherit endocrine peculiarities, and if an individual inherits an endocrine system that permits a growth of tumor cells, he is apt to pass it on to those who follow in his family. The opinion of investigators is that irritation, be it chronic or acute, and a predisposition, which is nothing more than an inheritance, are necessary for the development of, we will say, cancer. The same thing is true, I believe, of cystic formation and other tumors. I know of one family in which adamantinoma, for instance, has occurred in two members of the same family. The history of the patient in the diagnosis of any oral tumor will, many times, be of great value. The wonder is that, in the oral cavity, we do not have more tumors and more patho-

logic conditions. Take, for instance, traumatism alone in the oral cavity. Add to that the fact that the teeth protrude through the epithelium and mucous membrane, with a juxtaposition of different types of cells, which we know lends itself frequently in other parts of the body to the occurrence of malignant growth. The so-called mucous cyst and the dermoid cyst, in fact all cysts, are better treated by complete enucleation of walls and linings. If the operator feels that any part of the lining remains, and he can, to some extent, know where that is, it is wise to use the actual cautery on that spot. It may be that it would not return if only a few cells are left, because a preponderance of cells that are responsible for repair may cause the obliteration of the cyst cells. The so-called ranula has been treated in many ways. It usually occurs as a mechanical obstruction to the natural function of the gland; which indicates that if restoration of that function can be accomplished, the gland had better be retained. It might be demonstrated that a single calculus is obstructing the natural discharge of the gland, and if that calculus can be removed, the gland can be restored to function. That is not the usual thing as the gland itself is a complicated structure, and when one portion of it is interfered with, it sets up an inflammation of the balance of the gland, and the back pressure, as a result of the constant increase in fluid within the gland, causes destruction by stopping the circulation to the tissues of the gland. In many of these glands in which calculus is responsible for the obstruction, an effort should be made to establish drainage by removing the calculus. These ducts can be stretched and dilated much more easily than we are inclined to think. In some instances, I have injected procain around the duct. It will do no harm if we actually inject procain into the duct. We can relax the wall of the duct by the application of cocain. We can then place a small hemostat in the mouth of the duct, stretch it open and carry the hemostat to the point where the calculus will follow it out through the mouth of the duct. The duct, even though stretched and dilated, will return to normal size. It will have to be watched and taken care of afterwards. It may be that the future will tell us that these salivary glands have within them islands producing important secretions. The parotid gland and the salivary glands have not been studied from that point of view. It is not outside the field of reason to believe that a gland carrying an important digestive element may be found to carry still more important elements. That may have an influence on the human economy. The late Dr. Brophy treated ranula by opening the gland and placing a perforated silver ring in the gland. If Dr. Lyons can successfully demonstrate that the ranula possesses the characteristic of a true cyst, his suggestion that the gland be removed must be accepted for the reason that a cyst has no physiologic purpose; the tissues composing it may never return to a normal tissue, and tissues that are not normal have a tendency to become malignant. The so-called median line cyst is, I believe, no different from the same cyst occurring in any other place in the oral cavity. Most of the median line cysts that I have seen have had some connection with the incisor teeth. I have seen some that had no connection with them and treatment of them in no way necessarily requires a consideration of the teeth; but in that particular type of patient and cyst, I have found that if the cyst is in the one location which has no connection with the teeth, it is well to examine the entire oral cavity or both maxilla and mandible roentgenographically because the patient may have a similar cyst in other locations. That is a good practice in any case. I have had three different patients that have had this type of cyst in different locations in the mouth. One young woman had five different cysts in the upper and lower jaws, separate and distinct from each other. The same was true of a young man of about the same age, 21. In another case, a woman, aged 55, had a number of cysts occurring in the lower and upper jaw. These cysts were filled with a cheesy material. At first, I thought that the condition was tuberculous. That could not be demonstrated and the wall was destroyed and removed. These cysts are, I believe, due to hereditary embryonic rests which are activated by infections or traumatism. Not that the cyst itself necessarily becomes infected, but the defense mechanisms are excited at that place. It is one type that I believe occurs as a result of hereditary characteristics, being due to the controlling influence of the endocrine mechanism. In the removal of the cyst, the

entire cyst should be dissected away from its surrounding tissues without evacuating it, if possible, at least to the point where there is enough of the cyst wall detached that the collapsed sack itself can be grasped with a hemostat and, with gentle force and blunt instruments, torn away from the remainder of its attachments. A cyst that has been under pressure for quite a while, will, in my experience, tear away more easily and clearly than one that has not been existing under pressure. If, for any reason, we believe that a portion of that wall remains, it is well to touch it with the actual cautery. Most of the cysts that have undergone pressure have a squamous epithelium lining; nor does the cyst always remain nonmalignant. Recently, I was called on to remove a cyst that had been present for a great number of years, in a patient of 60 years. The age of the patient, the fact that the lesion was infected owing to an opening that had been made and a recent increase in size of the cyst led me to the belief that there might possibly be a beginning malignancy. The cyst, which had destroyed the wall of the antrum by pressure, was removed and examination of the wall of the cyst showed that it was a carcinoma. This particular cyst, after the wall had been removed and found to be malignant, was treated by radium. Dr. Havens, of the Mayo Clinic, says that it has been the experience of the clinic that malignancy of the antrum yields to treatment with radium and, in this case, a second examination of tissue after the first application of radium revealed no cancer cells. A second treatment with radium was given to avoid the possibility of return of the malignancy. So far, there appears to be no recurrence. There was quite a large opening in the antrum when the cyst was removed and the wall was pushed back under the floor of the orbit. Examination of that wall showed that it was very thin and apparently was receiving no nourishment. It was decided to remove it and to allow the antrum to remain open so that it could be observed from time to time during treatment. As it gradually closed and the tissue took on a normal appearance, it can be supposed that, in this particular case, the radium saved the patient's life. The line between granuloma and cyst is rather fine. A granuloma should be treated as if it were a cyst in the majority of cases. It indicates an elaboration of connective tissue, and if the epithelial lining is characteristic enough, it will develop into a true cyst. I do not believe that the production of a cyst depends on changes of long standing entirely, but rather on the nature of the irritation. I have seen the injection of irritating substances such as formalin, creosol, salt solution or even sodium bicarbonate into the tooth change a granuloma into a cyst in a comparatively short time. Therefore, it is not a good idea to treat granuloma with substances that are too irritating. It is characteristic of Nature to use connective tissue wherever it can to localize an irritation and to confine it to a particular area with the evident intention that it will eventually open and slough out the contents. Nature has only two methods of destroying substances of that kind, either foreign or otherwise: resolution and absorption as liquefaction and discharge of the material. I have, I believe, seen as many large cysts in the mandible as in the maxilla. In the maxilla, development of a cyst may be more active owing to lack of resistance. Whenever a cyst of this character contains a fluid that is darker than amber, a small hemorrhage or an infection or malignancy are beginning to play a part. The best instrument that I have to aid in the diagnosis of a cyst is a small hypodermic needle, which when passed through the wall of the cyst, will almost invariably give the parchment-like sensation to which Dr. Lyons refers. If an ordinary piece of heavy writing paper were held lightly between the first two fingers and the needle passed through it, the sensation conveyed to the fingers would not be unlike that conveyed to them in passing a needle through the cyst wall. In the follicular cyst, the tissues have not formed properly and have allowed the misplacement of a tooth. The wonder is that this type of cyst does not become malignant, if embryonic rests are responsible in any measure for the production of the carcinoma. The differentiation between an acute abscess and a cyst should not be difficult for the reason that an abscess causes such acute symptoms and cysts tend to have a history of chronicity. It is sometimes hard to distinguish between a cyst within the bone and covered with dense tissue and a beginning sarcoma, for the reason that they both occur painlessly. In these cases,

aspiration is of value, but then, too, we must take into consideration the danger of irritation because either a carcinoma or a sarcoma may be stimulated to activity by a simple irritation. The roentgen-ray examination should always be one of the first procedures even though it does not seem necessary. It will aid in diagnosis and obviate error to some extent, and may aid in determining the exact characteristics of the tumor. Further, it may indicate the possibility of malignancy being superimposed on some benign growth. The multilocular cyst or adamantinoma, if that term will cover the classification is, of course, considered a benign tumor, but, if neglected, it becomes almost as serious as a malignant lesion because of its extent. Curettement of these tumors to a point beyond where tumor tissue is thought to exist is not bad practice. I have in most cases used an actual cautery after curetment. Radium was also used. It has been my experience to find these lesions in males, contrary to the belief of Dr. Lyons. Two of those occurred, as I mentioned previously, in one family. It is very likely that an endocrine dysfunction is responsible for an adamantinoma. If it is a misplaced cell or an embryonic rest, the mechanism responsible for the control and direction of the cell is not normal. The method suggested by Dr. Lyons in the treatment of these cases is the correct one, with the addition of the actual cautery and radium in some cases. The material within the cyst is harder. Just why the growth does not metastasize or become malignant is not clear, since it is evidently of an embryonic character. Why some growths metastasize and others do not is not yet understood, but it is probably due to the character of the condition governing these growths, either a lack of control of the normal cell or an imbalance of the endocrines. In the two cases in which radium was used with decided effect, there was no recurrence. I know that it is not generally used, but radium therapy should be added to surgical treatment in adamantinoma. The papilloma or wartlike growth found in the mouth is benign until it penetrates the basement membrane, just as it might in any other locality. If it does penetrate the basement membrane, it takes on malignant characteristics. It is surprising how long these growths will continue in the mouth without causing any disturbance. The epulis is a fibrous growth of rather common occurrence and many epulides do disappear without treatment. I have seen them take on malignant characteristics and have seen the malignancy yield to radium after their removal. The success of radium therapy in all these cases of malignancy depends to a large extent on the age of the malignant cell. The early or young malignant cell will succumb to radium where the more mature will resist it. In the removal of the epulis, it is well to cut down to the point where it is attached to the periosteum and destroy that area with the actual cautery, to prevent recurrence. It is well, as regards the alveolar process, to go to a point beyond the actual growth itself. The irritation resulting from their removal may tend to make them take on malignant characteristics sometimes, but they should be removed and the suspicious cases treated with radium. The cartilaginous or mixed tumor is one of the most difficult to deal with. Recently I was called on to examine the mouth of a patient to see whether a denture might be readjusted. The palate was pushed down so that the denture could not be replaced in the mouth, a condroma being present in the nasal cavity. The lesion had been examined repeatedly and said not to be malignant. It is not enough to know that these growths are not malignant: we must know what they actually are. The condroma is now displacing the eyes and while it seems to be somewhat arrested by deep roentgen-ray treatment, it is persistent in its growth. The mistake in this case was that, at the time of the examination, the true nature of the tumor was not made clear. Those concerned were satisfied with the statement that it was not a malignant growth and did not show carcinoma cells. I remember a spindle-cell malignancy occuring in a boy of 8 years. A tooth had been extracted and a growth protruded into the socket. Repeated examinations of that tissue showed that it was not malignant. Finally, it was decided that a tooth was coming through but was still deep in the zone. The temporary tooth had not been lost and the cusps of the oncoming permanent tooth were sharp. It was decided to remove the tissue overlying the permanent tooth. The sharp cusp was irritating the intervening tissue. The tissue just overlying the cusp was found to contain spindle cells.

Irritation played a definite part in the production of that malignant growth. Sarcomas are harder to deal with and more serious than are carcinomas, probably owing to the fact that we know a little more about carcinoma, even though our knowledge is meager. A sarcoma in a young patient, as Dr. Lyons has said, is disheartening. It is more serious and harder to control than is early carcinoma. We know what affects the cell growth of carcinoma, but in the case of a sarcoma, we know less. The lymphatics in all cases of malignancy play an important part in metastasis, and sometimes one questions whether malignant growths would be so dangerous if it were not for the lymphatics. In other words, if there were no lymphatics, would we have metastasis? The more malignant a tumor becomes, the more likely it is to metastasize. It looks as if these spindle, round, and giant cell tissues are either misdirected by an endocrine influence or are without the influence that should limit their growth and placement. It is reasonable, then, that early surgical treatment is the only hope at the present time, and the earlier these lesions are removed, the better for the patient, since the more mature the malignant cell is, the harder and more stubborn it is to deal with. In some patients, a matter of a few days is a very important thing in the management of these cases. The epithelioma is a little less malignant or, at least, it yields itself a little more readily to the treatment than does the carcinoma. That is possibly due to the fact that the epithelioma, as a rule, is a younger and less mature cell and seems to have a tendency to operate for a longer time on the surface. Epithelioma, in these days, seems to yield readily to the use of radium and surgery. The so-called carcinoma which tends to grow down toward the basement membrane or the underlying connecting tissue is of vicious character and should be operated on with a view to getting entirely outside the growth itself. Operation should be performed when there is the least danger of metastasis. In the case of either sarcoma or carcinoma, it is not a bad idea to treat first with deep roentgen-ray therapy and then to treat surgically. An application of radium or deep roentgen-ray therapy has an arresting influence on the cell. It is a good idea also to treat them afterwards with either the roentgen rays or radium. There should be a lapse of time after the initial treatment before surgical interference, from one week to three weeks in the case of a sarcoma. In the case of carcinoma, it is not safe to wait so long. There is something peculiar about the carcinoma or the epithelioma that occurs above the clavicle. It does not seem to have the same tendency to metastasize. Dr. Lyons refers to heredity as a factor in the production of these growths and, if that is a factor, the endocrines must be taken into consideration. The factor to consider in these cases is the influence of the endocrine system and its byproducts. Hormones, vitamins and endocrine secretions are involved in the growth of normal tissue and may be concerned in the production of abnormal tissue. To my mind, the hereditary influence is explained by the fact that the endocrine system and physiologic peculiarities of that system are inherited. Marriages of persons with malignant tendencies will tend to increase cancer but marriages of persons with a resistance to malignant tendencies will tend to protect the human race against the threat of malignancy. Do not become hysterical when you see a new growth of tissue in the mouth. Observe all of the evidence that your knowledge will permit you to utilize, and make use of exclusion in your diagnosis. Realize the danger of both acute and chronic inflammation. Rule out the possibility of syphilitic lesions, and take into consideration that sometimes these lesions become malignant. Take the patient's history and family history; and, last of all, do not permit lesions to remain in the mouth long enough to become malignant, because there is no opportunity and no responsibility that holds out more possibilities to suffering humanity than does the early recognition and early treatment of these lesions.

THE DIAGNOSIS OF DENTOFACIAL DEFORMITIES*

By B. E. LISCHER, D.M.D., San Francisco, Calif.

IN medicine and surgery, it is generally acknowledged that diagnosis constitutes one of the most important phases of practice, for it comprises all methods and procedures employed to determine the nature and extent of diseases and deformities.

The widespread belief that the diagnosis of a dental anomaly is usually a simple matter, that the classification of its dental malocclusion includes the diagnosis, is certainly erroneous. All too frequently, the practitioner fails to procure the essential data upon which every diagnosis should be based; attempts to prosecute his tasks without fully acquainting himself with the intricate nature of the problems confronting him, and proceeds with the treatment of a deformity without making, or completing, the diagnosis.

While it is true that sundry forms of malocclusion of the teeth respond favorably to standardized, mechanical orthodontic treatment, an appreciable number of dentofacial deformities do not yield readily, nor completely. Strive as he may, every orthodontist eventually garners his quota of failures, regardless of the methods of treatment that he employs in his practice. Some of these failures are undoubtedly due to faulty diagnoses.

*Read before the Section on Orthodontia at the Third Triennial Session of the Pacific Coast Dental Conference, Seattle, Wash., July 7, 1932.

It is very rare indeed for only one tooth to be malposed. Usually, several teeth and their supporting alveolar process are involved. Not infrequently, the entire denture presents anomalous relations, though the several parts are variously affected. In still other instances, the bony structures of the jaws and the external facial features may be deformed. Lastly, since a dental anomaly may result from endocrine dysfunction and require more than mere mechanical therapy, the diagnosis should embrace a record of biochemical procedures, provided by the physician.

Thus, it is obvious that the widely used phrase "malocclusion of the teeth" does not adequately express our present comprehension of dental anomalies; that the further, finer and more precise development of our diagnostic methods is desirable and urgent, not only to increase our knowledge, but also to advance our skill and reduce the number of our failures.

The following are, briefly, the data which every practitioner should procure prior to completing the diagnosis of a dentofacial deformity. Doubtless, there are many incipient anomalies in the young which an experienced dentist can treat successfully without first obtaining all of the criteria to be considered, but even these may disclose facts which might well be recorded because they frequently enlarge our understanding. In other words, we fail to use the scientific method if we do not record our observations and expe-

riences fully and if we verify them only by inference.

THE WRITTEN RECORD

Every orthodontic case history should contain much pertinent information which is never recorded in such material data as plaster denture reproductions and customary facial photographs. This portion of the record should fulfil the following definite requirements:

1. It should contain relevant facts of the patient's history. By asking a number of suitable questions, one may gain knowledge of the teeth of parents and other relatives, as to whether they required orthodontic treatment or they were anatomically correct. The facial form of parents, brothers and sisters should also be observed. Inquiry as to whether there were any serious illnesses during infancy should also be made. Recurrent attacks of "colds," the presence of adenoids or their removal, hypertrophied tonsils and other affections of the nose and throat; the manner of feeding during infancy; the age when the temporary teeth began to erupt, to ascertain tardiness or prematurity of the process; and the possible influence of various habits and of traumatic, congenital and hereditary factors should all be considered and recorded.

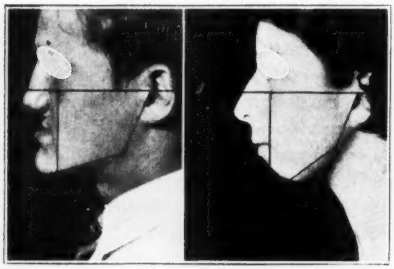

Fig. 1.—Mandibular protraction and mandibular retraction.

2. Observation and examination of the patient may now be instituted. We begin by noting the facial form and expression; the function of breathing; the relation, form and size of the lips; the relative size of the teeth; their number, form and structure and those affected by caries; the number, kind and location of restorations; the pulps affected by disease; the condition of the gums, oral mucosa, etc. Determination with suitable calipers of the length and bilabial height of the oral fissure, of the facial width and height and of head width and height and computation of the facial and cephalic indices may also be executed.

3. The etiology of dental anomalies is not well understood, but space on the written record should always be provided for recording the causative factors which the practitioner observes, and which his material data may reveal. If these findings are indexed, the records of an orthodontist will, in time, furnish valuable information. Total disregard of these problems will never solve them.

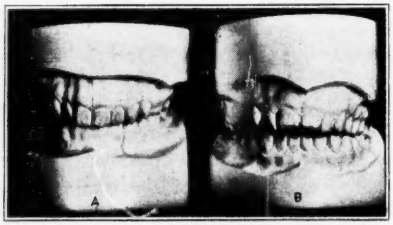

Fig. 2.—Mandibular attraction and mandibular abstraction, the latter being complicated by attraction of maxillary incisors.

4. Diagnosis during examination should usually be tentative, for it can seldom be concluded without denture and facial reproductions, and further study. The natural occlusion of the patient's denture should be entered on the record at this time. The terms which I suggested

in 1911, namely, neutroclusion, bilateral and unilateral distoclusion and bilateral and unilateral mesioclusion, are applicable during this preliminary survey and are helpful during construction of the plaster denture reproductions.

5. An orthodontic prognosis is a forecast of the probable result of the anomaly, and most parents are grateful for an opinion from the practitioner concerning the child's deformity. Of course, these judgments necessarily depend on the conditions found, and vary with the ability and training of the observer, but they always deserve careful consideration; and, whatever the verdict in a given instance, the operator should invariably enter a brief account of it on the record. (This also applies to his estimates and explanations of the treatment required.)

Fig. 3.—Photostatic facial reproductions of cases in patients whose denture reproductions are shown in Figure 2.

In my experience, it has been found convenient to compile the greater portion of a written record during the short time when the parents were present, on examination forms prepared for the purpose, and which were duplicates of the permanent forms. (The former were of a pale straw color to distinguish them from the latter.) After the other data about to be described were at hand, I then reviewed them carefully and systematically. Corrections and additions were made when necessary and, if the patient was accepted for treatment, this record was then copied on white, permanent forms with a typewriter.

Every dentist finds it advantageous to employ a secretary, and every worthy secretary takes pride and interest in keeping records. She usually finds such an important task a welcome and instructive change from the drudgery of the day's work. She should also be taught how to compile an index of all important data which such records contain. Without comprehensive statistics, orthodontia will never achieve the goal it deserves. Our services are too important to patients, and our obligations to the art too compelling, for us to undervalue scientific records; but even scientific records are more useful if they are properly cataloged and made accessible.

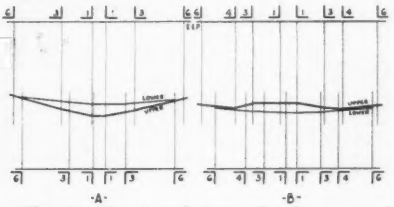

Fig. 4.—Graphs of the occlusal curves of the teeth shown in Figure 2.

PHOTOGRAPHIC FACIAL REPRODUCTIONS

Any one who undertakes the treatment of dental anomalies becomes interested in the facial deformities which so frequently complicate them. This concern may vary from a desultory regard for a patient's comeliness to a sincere attempt to understand their real significance. It is a serious blunder for one to form a hasty opinion on such an important matter, and to conclude that facial deformities of this nature are inconsequential symptoms which will disappear, or at least be improved, if orthodontic treatment is applied to the dental anomaly. That naïve attitude of the days

of our orthodontic infancy is partly responsible for the inertia which still retards our progress. Fortunately a more precise judgment is gaining acceptance, one which recognizes that facial involvement presents diagnostic data of great value.

When we consider that customary dental "models" only record relations of the teeth and rarely deformities of the jaws, that the usual facial "photos" always fail to reveal the underlying dental deviations which frequently stand in causal relationship to the facial deformities, we can readily understand why some orthodontic treatments are not successful. It is evident that these widely used diagnostic

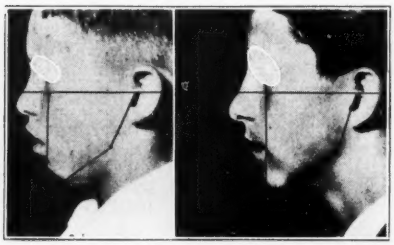

Fig. 5.—Response of mandibular retraction to orthodontic treatment.

data of a given patient can be so unrelated, if certain necessary precautions are not observed during their procurement, that they may forfeit most, if not all, of their scientific value. Without doubt, every practitioner can sharpen his powers of observation and improve his diagnostic acumen far more rapidly by recording every patient's face than is possible by mere momentary notation.

Our interest in the lower half of the morphologic face (the "changeable area," as the late Dr. Case used to call it) compels us to examine the points, lines, angles and conformation of the features found therein, as well as the deformities which we universally accept as symptoms, complications and consequences of dental anomalies. Our diagnostic approach should be based on morphologic principles, so that the form relations of the denture, and its relations to the patient's head and face, may be definitely determined. To ascertain these with comparative ease and accuracy, Simon devised gnathostatic (cephalometric) diagnostic methods in which photostatic procedures form an integral part. Moreover, these methods are so standardized and simplified, and the equipment for executing them is so perfected, that anyone may now avail himself of their use and value.

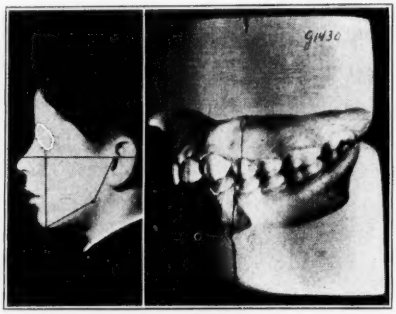

Fig. 6.—Maxillary dental and alveolar protraction.

Time and space prevent comprehensive presentation of the importance of photostatic facial reproductions. Suffice it to say that when the mandible is excessively developed, or arrest in growth is extreme, the resultant deformities are too momentous to be ignored; and all such deformities are not only distinctly recorded by this method, but they may also be readily evaluated if the facial reproductions are made to scale, and if certain cephalometric points such as the gonion, tragion, gnathion and orbitale are marked previous to the exposure. Or, when the height of the lower third of the face is

involved, because of extreme so-called over-bite, or open-bite, the distance from subnasion to gnathion may be affected. Again, in appraising the value of a given treatment, e.g., of total mandibular retraction, a subsequent photostatic facial reproduction, made in precisely the same manner, will reveal its progress.

PLASTER DENTURE REPRODUCTIONS

Plaster "models" have long been accepted as an essential part of case records and are deemed indispensable for diagnosis. They can be constructed in various ways and are often referred to as "study models." Certainly all plaster denture reproductions made for diagnostic use

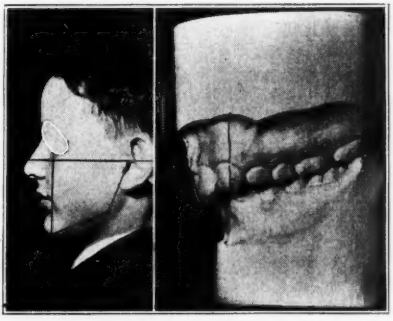

Fig. 7.—Mandibular dental and alveolar retraction.

should be worthy of study, but, unfortunately, most of them are not. "Snap" impressions and models have little, if any, scientific value, are entirely obsolete and should be discontinued. "Artistic models" are, as their name implies, *models,* i.e., they are show pieces. These may be very accurate in some particular details, but they lose most of their diagnostic value when unrelated to the patient's head. Cephalometric orientation has become indispensable.

I am not advocating slovenliness and inaccuracy of technic, but our diagnostic data are not, primarily, museum pieces. It is entirely meet and proper to avoid emotional attitudes in a matter of this kind; hence, we should strive to produce plaster denture reproductions which fulfil definite scientific requirements, and wean ourselves from the moods and modes that overemphasize artistic qualities by sacrificing scientific needs. After all, the

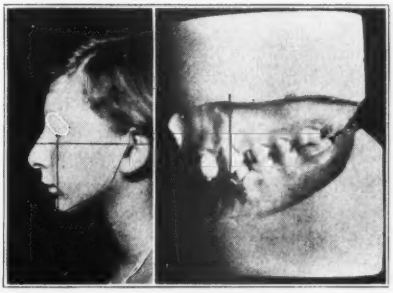

Fig. 8.—Total mandibular retraction.

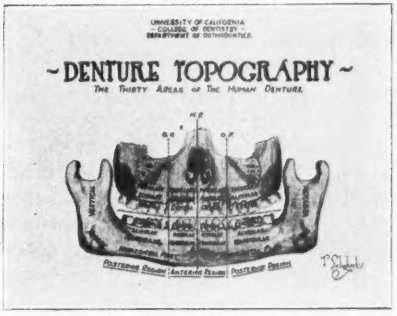

Fig. 9.—Topography of man's denture.

purpose of a reproduction is intensely realistic, not idealistic.

If our denture reproductions are constructed with the aid of a gnathostat, and in accordance with cephalometric principles, we not only record several very desirable dental details, but also sundry dentocranial relations. For example, every orthodontist recognizes so-called

distoclusion. But is the apparent posterior relation of the mandibular arch confined to the teeth? Or may it be due to an arrest of development of the mandible? Again, may not the maxillary teeth occupy an anterior position in relation to the face and mandible? Undoubtedly, all of these possibilities are met with, though not disclosed, in customary "models," but are easily diagnosed with the aid of gnathostatic denture and photostatic facial reproductions.

For many years, we all but agreed unanimously that dental arches may be too narrow, though we have not been very precise in the terms we employ in describing such deviations, nor very accurate in differentiating the various forms of contraction. Now in a discussion such as this, it seems appropriate to ask: Is a narrowing of the dental arch due to the fact that only the coronal portions of the teeth are too near to the median sagittal plane, or are the alveolar process and the roots similarly involved? In a cephalometrically orientated denture reproduction, one may readily differentiate these modifications. And the kind of deviation disclosed in a given case is extremely important, for it determines the kind of treatment we should apply. In other words, intelligent, scientific treatment always implies accurate differentiation.

In other instances, when such differentiation appears difficult, we can draw three-dimensional graphs which are based on accurate measurements of the plaster reproductions. Norm patterns marked on the graphs will facilitate correct appraisal and help us to gain a much clearer understanding of the anomaly. These supplementary methods enable us to localize and evaluate the extent of the deviations in a manner heretofore believed impossible.

ROENTGENOGRAPHIC DATA

Roentgenography has been employed in oral diagnosis for more than thirty years and has conclusively demonstrated its value. Simpson has aptly stated:

> A thorough radiographic examination requires an intimate knowledge of the regional anatomy, a keen discrimination of the physiologic and pathologic factors involved, an appreciation of the limitations encountered, and an acute sense of obligation toward the service. These qualifications are acquired only by professional training and extensive clinical experience, and even this preparation is not infallible.

The well-developed technic of roentgenography enables us to procure a comprehensive, thorough interpretation of every patient's denture, which is always advisable as a preliminary diagnostic procedure. We are thus better qualified to differentiate anomalies of eruption, form, number and position of the teeth, the condition of alveolar crests and septums of the teeth involved in the anomaly, and of root ends and periapical areas. The presence of incipient dental caries and diseases of the pulp and pathologic conditions of pulp canals, as well as deciduous roots and foreign bodies, may also be determined with the aid of roentgenograms.

THE DIAGNOSIS OF A DENTAL ANOMALY

An orthodontic diagnosis has been defined by Simon as "the search for, and determination of, the difference between the existing denture of a patient and the condition to be established."

Because an anomaly is not a disease, but a deviation of form, it follows that the diagnosis is a morphologic problem. In establishing a diagnosis, we should ascertain the form relations of a patient's denture in the three dimensions of height, width and length, and its relations to the head and face. After the objective data described above have been procured from a given patient and prepared for critical

analysis, a diagnosis can always be made with greater certainty. Such a systematic procedure helps us to establish the real nature of the deformity and minimizes the danger of being swayed by prejudices or preconceived notions. Far too many diagnoses are based on subjective opinions.

Because the top or base of a gnathostatic maxillary plaster reproduction represents the horizontal eye-ear plane, and the lower model is made parallel with it, and because the median sagittal and transverse orbital planes are marked on the reproductions during their construction, our ability to evaluate the deviations in three dimensions and in their cephalometric relations is increased. By employing the planes as base lines, we can determine the symmetry, or asymmetry, as well as the kind and degree of the deviations.

Bearing in mind the topography of the denture, we can differentiate the various modifications into dental, alveolar and maxillary for the upper and dental, alveolar and mandibular for the lower denture. We can further localize them into anterior and posterior, total, unilateral and bilateral. With the aid of photostatic facial reproductions, we can differentiate mandibular involvements into horizontal, i.e., when the body of this jaw is affected, and vertical, when the rami are involved, and we may also note modifications of the mandibular angles.

A PRACTICAL METHOD OF CONSTRUCTING CONTINUOUS GUM DENTURES*

By JAMES L. HOWARD, D.D.S., Hollywood, Calif.

IT is easier to teach the average dentist a practical method of constructing continuous gum dentures than it is to convince him that the continuous gum denture is practical.

His attitude is not to be wondered at when we consider that the all-porcelain denture and its descendant, the platinum base continuous gum denture, have been constructed for over a century and a half, and for the most part have been but an expensive luxury. They have been expensive because the old methods of construction required an excessive amount of time and skill and too much "servicing" after delivery of the case. They have been a luxury because the patient has been required to pay a high fee for a beautiful but unsatisfactory service, yet the dentist may not have received a fee commensurate with the time and service given.

The all-porcelain denture was not practical because the method of construction required that it be spot ground to even approximately fit the mouth. Moreover, it was easily broken and repair was difficult if not impossible.

The old Allen "continuous gum denture" was made with long platinum pin

*Read before the Prosthetic Section of the Third Triennial Session of the Pacific Coast Dental Conference, Seattle, Wash., July 6, 1932.

*The reading of this paper was followed by presentation of a moving picture showing the author's complete technic for making a continuous gum denture.

teeth soldered to the platinum base. (Fig. 1.) A misfit always resulted because warpage of the base, from shrinkage of the porcelain, could not be overcome by swaging for fear of breaking the teeth off. It was also necessary to use low fusing porcelain to prevent overfusing the teeth, which went into the furnace each time a layer of porcelain was applied. This resulted in a weak, porous structure of porcelain which had to be supported with iridioplatinum wire trusses and doublers. This type of denture was also easily broken, difficult of repair and could not be refitted. In fact, the continuous gum denture has always been considered the finest, yet the most troublesome, kind of denture made.

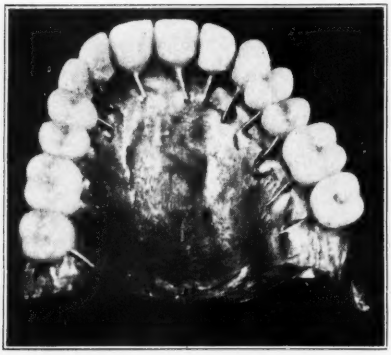

Fig. 1.—Denture illustrating old method of construction, known as the Allen technic.

But why were such unsatisfactory dentures ever constructed? Primarily because a French chemist did not like the odor and taste which emanated from the old ivory plate that he was wearing and so set about to try to make for himself a denture of a low fusing porcelain material which he hoped would be more hygienic. The dream this chemist had a hundred and fifty-eight years ago came true. Its hygienic and nonirritating properties are two of the reasons for porcelain being used as a denture material, and of even greater value is the esthetic result.

There has never been a material that can compare with porcelain as a substitute for the natural human gum. It has a beauty and lifelike appearance that no other gum substitute possesses. It adds life and beauty to the artificial tooth as a harmonious frame contributes to the beauty of a fine painting. No other gum substitute than porcelain can be shaded to give that realistic anemic effect of the gum where it is stretched over the root eminences, or that characteristic appearance of gingivitis or incipient pyorrhea along the gum margin. With a little study, practice and some artistic ability, the natural gum can be so nearly imitated that detection is almost impossible.

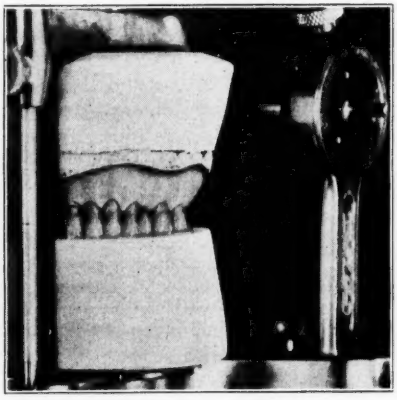

Fig. 2.—Denture showing porcelain built down to and around necks of teeth.

Porcelain when glazed has a smoothness to the tongue, lips and cheeks not unlike that of the mucous membrane. This is greatly appreciated by patients and they seldom fail to mention the fact.

Summing up the foregoing paragraphs, we conclude that the continuous gum

denture has been a great success artistically and hygienically, but a failure practically.

Generally speaking, this is true, but there are, of course, exceptions to all rules. In this case, the exceptions occurred when the operators were unusually skilful or the patients were carefully selected. The secret of success in many cases was due to the patient's vanity predominating over her sense of comfort.

The following quotation, from a newspaper, speaks for itself:

WOMAN WILLS TEETH TO DENTAL COLLEGE

White Plains, N. Y., April 11, 1931.—A document "with teeth in it" is the will of Mrs. Mary A. Hudson, widow of an English

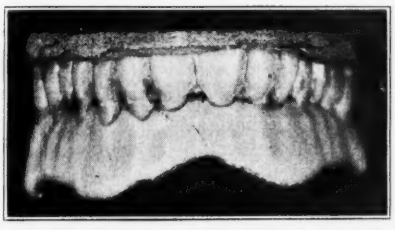

Fig. 3.—Alundum matrix holding teeth in position while being fused to porcelain base.

Engineer, who died last Thursday in Glasslands Hospital. It was filed here today and says: "I leave these dentures to the dental colleges in the hope that they may prove an incentive to dentists to equal or possibly excel the work of Dr. John Allen." The dentures are platinum-based artificial teeth. One set is sixty years old. The dentist who made them died in 1897.

There is no doubt as to the reason for the success of this case. Dr. Allen, the dentist who made them, was the originator of the platinum-base continuous gum denture and naturally was more expert in this work than any one else.

Technics that require unusual skill are not practical for the average dentist. Dentures that can be made to fit only selected mouths are not desirable. Neither are porcelain dentures practical unless the shrinkage and warpage of porcelain can be controlled to such an extent that they fit the cast on which they were swaged as well when finished as they did before any porcelain was applied. A denture is not practical that cannot be repaired or refitted.

The technic that I employ retains all the esthetic, nonirritating and hygienic features of the older technics and in addition makes possible a platinum-base porcelain gum denture that fits, can be refitted and repaired and is lighter and stronger,

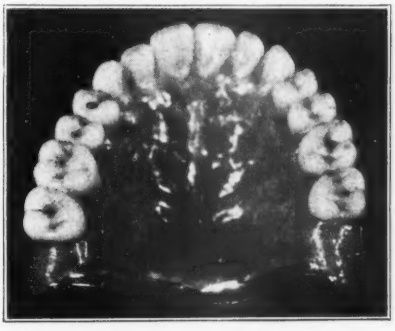

Fig. 4.—Completed denture.

with finer porcelain that can be ground into and polished and, last but not least, simplifies and makes practical the construction of continuous gum dentures.

Most of these improvements have been made possible through the use of pinless teeth, which are attached after the application of the several layers of body porcelain, this permitting correction of warpage of the base, caused from shrinkage of porcelain, by swaging.

Briefly, the technic is as follows:

A base of 30-gage platinum is made and a thin layer of 2,300 F. porcelain is fused to it. (Formerly, Close's or Allen's

porcelain body fusing at 2,100 F. was used.) The base is now placed on the cast and seated in the swager, and pressure is applied until the warpage which took place during the firing is corrected. Another layer of 2,300 F. porcelain is applied, fused and again swaged. This is repeated until there is a sufficient amount of body porcelain covering the palate and extending down to and around the necks of the teeth. (Fig. 2.) Each time a layer is applied and fused, the base must be again placed on the master cast and swaged. The cracks caused by swaging are filled in with each succeeding application of porcelain.

The teeth are now fused to the base with 2,100 F. porcelain. By the use of lower fusing porcelain to attach the teeth, the fusing point of the 2,300 F. body porcelain is not reached; therefore, there is no warpage, and, consequently, no necessity for swaging after the teeth are attached. The teeth are held in place while being attached to the base with alundum cement. (Fig. 3.) The next and final layer of porcelain is pink enamel which fuses at 2,000 F. (Fig. 4.)

With the use of ordinary care, there is little chance of serious error with this technic. Contrary to former methods, we are able to check each step and correct any mistakes as we proceed. The results obtained are exceedingly gratifying and in sharp contrast to those of a few years ago. The old time continuous gum denture was undoubtedly the most troublesome and mechanically unsatisfactory denture made, but now it is just the reverse. Almost without exception, the continuous gum denture is the better fitting and less irritating, requires less "servicing" and is appreciated more by the patient than is any other kind of denture.

Great opportunities confront us in the field of porcelain dentures. Possibilities are unlimited and the need is great for more thought and research along this line. That there is no demand for such service is a fallacy. There is always a place for high-grade service, but a demand cannot be created for it unless the dentist himself first develops an appreciation of the subject through the knowledge and skill which comes from experience. Unusual service requires a little extra time and thought, a few more hours and a little more care; but after the technic is mastered, it becomes as simple as any other operation.

This method which will be shown not only has simplified the technic but also has improved it in almost every way, until we can now conscientiously recommend to our patients the continuous gum denture, with the assurance that there is nothing better and with the knowledge that we are rendering them real service.

A PRACTICAL ANALYSIS OF REGULAR DENTAL PROPHYLAXIS

By M. H. GARVIN, D.D.S., Winnipeg, Canada

THE material analyzed for this report on the value of regular dental prophylaxis has been taken from the charts and records of patients on our prophylactic list, including only those who have been on that list for more than two years previous to Aug. 1, 1931. A special record was also made of the condition of each patient's mouth when he or she returned for prophylactic care during the four months previous to August 1.

By our prophylactic list, we mean the list of those patients who have signified their desire to have us communicate with them at regular intervals for the purpose of making an appointment for a dental prophylactic treatment and examination.

This list was compiled as follows: A patient would consult us for some dental service, such as examination or prophylaxis, or in regard to an aching tooth, a broken tooth, a discolored tooth, carious teeth, periodontoclasia, etc. For many years, it has been our practice, in these cases, after pain has been relieved, to advise the patient of the advantages of having roentgenograms taken of all doubtful areas, such as pulpless teeth, areas where teeth were missing and teeth with deep periodontoclasia pockets. This involved, in many cases, a full roentgenographic examination of the mouth.

The pictures having been taken, the examination was continued and the service required was agreed on and completed. It must be remembered that all possible restorative dentistry was not completed at this time for financial and other reasons, which accounts for considerable operative expense later on. Where bridgework was undertaken, only the most modern type with inlay abutments was inserted. Also, for financial reasons, alloy fillings were frequently used instead of gold inlays. Pulpless teeth were checked carefully, not only from the roentgen-ray findings, but from the health and history of the patient. If the tooth appeared to be negative as to infection, the patient was healthy and the history did not give any undue concern, the tooth was left. Later, in the presence of some serious systemic illness, some of these teeth had to be removed, which accounts for most of the extractions in this group. Impacted third molars, particularly lower ones, were usually removed. Where periodontoclasia was present, it was cleared up. Some teeth that were doubtful as to periodontoclasia were retained for a time and kept under observation; which accounts for many of the extractions at a later date. In every case, we endeavored to place the mouth in a condition free from infection. The patients were instructed in the home care of the mouth and were advised as to the value of regular dental prophylaxis. They were then asked if they would like to have

us call them every three months or every four months as the case might indicate, or if they preferred to keep track of this themselves. Some preferred to keep track themselves, a system which usually failed. Some lived out of the city, or were only in the city occasionally, and it did not seem practical to place them on the list. Many were enthusiastic over the idea and their names were placed on our prophylactic list. It is this latter group that we are studying in this report. Nearly all of them were available by telephone, and they were called at the time indicated on their chart. We have not found any kind of printed notice nearly so satisfactory as the telephone for this purpose. Some became indifferent and were taken off the list. Many of these were later replaced, but our records in this report are taken only from those who were on the list continuously for the period indicated.

Table 1 presents a summary of the various groups comprising this list.

We would draw attention to the fact that the last two groups, that is, the office staff and those on the list less than two years, are not included in our analysis. Those on the list for less than two years include many who were replaced on the list at their own request and who had previously been removed on account of indifference, etc., as well as new patients who had not been on the list before. The men among the school teachers were only three in number and so were included in the list of business men. In regard to ages, these are approximate. In many cases, the exact age was known, but in other cases it was not. The column headed "All teeth present" refers to the number of patients who had all permanent teeth present at the time this survey was made. The average number of teeth missing means the number missing in each patient and includes third molars. The highest average number of teeth missing was found among housewives and business men. The average number of fillings in the mouths of each patient, as given in the last column, remains fairly constant in all the groups, although housewives had the most.

TABLE 1. — DATA ON GROUPS COMPRISING THE PROPHYLACTIC LIST

	Number Enrolled	Ages	Average Age	All Teeth Present	Average Number of Teeth Missing	Average Number of Fillings
School children (girls)	68	5 to 22	16	54	0.39	14.0
School children (boys)	59	6 to 21	15	49	0.30	14.0
School teachers (women)	31	24 to 54	37	3	6.00	15.0
Unmarried women	26	19 to 55	30	6	4.50	15.0
Business women	105	19 to 62	34	8	6.40	14.7
Housewives	220	22 to 70	44	3	7.70	16.0
Business men	241	21 to 81	45	13	7.60	14.9
Those with six teeth or less	15	55 to 77	59	.....	.....	4.6
Office staff and families	24	.....	.....	.....	.....	.....
Those on list less than two years	243	.....	.....	.....	.....	.....
Total	1,032	.....	.....	.....	.....	.....

Some explanation should be given of these figures. In the case of a child, for instance, one molar might have three alloy fillings, and later this child might have these replaced with a mesioclusodistal inlay, which would be recorded as one filling instead of three. Again, a tooth with several fillings might later be extracted, which would reduce the number of fillings in an adult group. A crown or bridge abutment was entered as one filling. Among the school girls, the average number of fillings was fourteen. All had one or more fillings, the maximum being thirty-five. Among the boys, the average was fourteen fillings. One had no fillings. All the others had two or more, and the maximum number was thirty-eight.

It is obvious from these figures that we did not succeed in eliminating dental caries by regular dental prophylaxis. We do believe that the incidence of caries was considerably reduced, though we have no controls by which to prove this statement. This is particularly true of the last few years, when, on observing caries running rampant, we were able to change certain habits, give certain advice or seek medical cooperation, with beneficial results. The regular visits made this observation and service possible, and had they not been made early, no doubt disaster would have followed. We might cite the case of a lawyer whose wife had been a patient of ours for several years and who came in one day and requested that we check over his mouth and place him on our prophylactic list because his wife's dental account had been half what it was when she came in intermittently of her own accord. We would further draw attention to the fact that these patients considered that they were receiving some definite benefit by this service; otherwise so many of them would not have adhered faithfully to this regular practice for so long a time as is indicated in Table 2.

TABLE 2. — YEARS ON PROPHYLACTIC LIST

Years on list	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Dental Years
School children (girls)	11	16	12	10	4	6	5	2	1	1	...	...	...	...	...	...	313
School children (boys)	5	12	11	8	3	7	6	6	1	...	...	...	...	...	...	...	309
School teachers (women)	4	7	1	3	4	3	5	2	1	...	...	...	1	...	...	...	175
Unmarried women	3	3	1	...	3	5	5	1	4	...	...	1	...	...	...	...	174
Business women	20	13	6	18	12	6	12	2	7	1	4	3	1	...	...	...	603
Housewives	48	24	19	19	18	21	15	21	9	4	10	8	2	2	...	...	1,319
Business men	47	30	22	24	22	17	18	19	12	10	6	5	4	4	...	1	1,458
Those with six teeth or less	1	1	2	5	...	...	1	1	1	1	1	1	...	...	...	...	101
Total	139	106	74	87	66	65	67	54	36	17	21	18	8	6	...	1	4,452

In Table 2, we have in the first column the number of each group who have been on the list not less than two years; in the second column, those on the list not less than three years, and so on, up to seventeen years. The man who has been on the list for seventeen years is now 81 years of age and is wearing a partial upper denture with six teeth on it, but has nearly all of his lower teeth.

In the last column, we have the num-

ber of dental years arrived at by adding the total number of years that each patient has been on the prophylactic list.

In Table 3, the general condition of the gums is tabulated under the headings good, fair and poor. In the first class was included those cases in which there was little tendency to develop a pathologic gum condition under conditions of regular dental prophylaxis. In the second group, designated as "fair," were placed the cases in which, from time to time, a certain amount of gingivitis or even periodontoclasia was in evidence. The third group, "poor," included those that were especially susceptible to periodontoclasia, many of whom required special periodontoclasia treatment at intervals.

TABLE 3.—CONDITION OF GUMS AND FREQUENCY OF VISITS

	General Condition of Gums			Frequency of Visits Months				
	Good	Fair	Poor	1	2	3	4	6
School children (girls)	56	12	0	.....	.....	11	47	10
School children (boys)	50	7	2	.....	1	15	39	4
School teachers (women)	5	12	14	.....	1	18	11	1
Unmarried women	11	13	2	.....	.....	13	13	.....
Business women	34	55	16	.....	.....	66	33	6
Housewives	35	127	58	1	3	152	62	2
Business men	59	133	49	1	1	178	57	4
Those with six teeth or less	2	6	7	.....	2	12	1	.....
Total	252	365	148	2	8	465	263	27

"The frequency of visits" refers to whether a patient was placed on the list to be called every month or every two months, and so on. The majority were on the three months list. More than 95 per cent of all the patients were on either the three or four months list.

In Table 4, the second column shows the number of patients who had no pulp involvement, which means that 96.7 per cent of all patients on the list, representing 4,452 dental years, had no pulp involvement while they were on the list. Twenty-five patients had some pulp involvement, but much of this had no bearing on the efficacy of regular dental attention to prevent it. The four teeth with dead pulps had large fillings at the time the patients were placed on the list, and we had no means of ascertaining what the exact condition was. This was also true of the five developing pulpitis under fillings. Prophylaxis had no bearing on the seven involved by accident or the two by malocclusion. Three pulps were lost by one school boy from an automobile accident. In the five cases of teeth treated as the result of neglected caries, the patients had delayed their appointments for some months owing to sickness or absence from the city. Four teeth were lost by pulp exposure. In these four cases, three exposures were connected with old fillings and one an obscure new cavity. The latter tooth would have been saved and the other three might have been saved had a roentgen-ray picture been taken earlier. Bite-wing films might have saved some of the teeth in other groups also, but it is very questionable whether many of them

could have been saved. Considering these results, we conclude that the universal use of the roentgen rays at regular intervals would not be justified from an economic standpoint.

We have not made a complete survey of the extent to which the roentgen rays were used during the time these patients were on the list, except in the case of the school girls. In this group, thirty-nine of sixty-eight had no roentgen ray pictures taken; five had one regular dental roentgenogram taken; seven had two pictures; three had three; one had four; two had five, and one had twelve. Seven had two bitewing pictures each. Two had two bitewing pictures taken twice at intervals. One had two bitewing pictures taken three times at intervals. These figures will give some idea of the extent to which the roentgen rays were used during the time these patients were on the list. Most of these pictures, with the exception of the bitewing films, were taken to determine the presence of permanent teeth under deciduous ones or the location of third molars, etc., rather than to locate caries, although they no doubt assisted in this regard.

A survey of Table 5 shows that 619 patients, or nearly 81 per cent as indicated in column 2, did not lose a tooth while they were on the list. The third column shows that 146 patients lost one or more teeth. One hundred and twenty-eight teeth were lost from periodontoclasia, as shown in column four, and 152 teeth on account of some health problem, the teeth being pulpless. Twenty-one teeth appeared to be infected, either acutely or chronically. Five teeth were lost either by accident or because the crown of the tooth, being nearly all filling, collapsed and was beyond repair. One tooth was extracted to correct irregularity. Three teeth were lost from exposed pulps. Exposure of the pulp in the tooth of the business woman was caused from neglect or inability to arrange an appointment for several months beyond the regular period. Exposure of the pulp in the tooth of one boy and one girl might have been avoided had bitewing films been taken early enough.

TABLE 4.—PULP INVOLVEMENT IN WHICH A ROOT-CANAL OPERATION WAS PERFORMED

	Enrolled	With No Involvement	With Involvement	Dead Pulp	Pulpitis Under Filling	Accident	Malocclusion	Neglected Caries	Pulp Exposure	Not Determined
School children (girls)	68	67	1	.....	.....	.....	.....	.....	1	.....
School children (boys)	59	58	1	.....	.....	3	.....	.....	.....	.....
School teachers (women)	31	31	0	.....	.....	.....	.....	.....	.....	.....
Unmarried women	26	23	3	.....	.....	.....	2	1	1	.....
Business women	105	103	2	.....	.....	1	.....	.....	1	.....
Housewives	220	209	11	3	4	1	.....	2	.....	2
Business men	241	234	7	1	1	2	.....	2	1	.....
Those with six teeth or less	15	15	0	.....	.....	.....	.....	.....	.....	.....
Total	765	740	25	4	5	7	2	5	4	2

Most of the teeth that were extracted were lost because of a root-canal operation or an extensive periodontoclasia previous to the time the patient was placed on the list. We should further state that, in a number of cases, in interpreting our records, there was some difficulty in determining whether a tooth which was pulpless was extracted essentially on account of some health problem or was extracted because it appeared questionable from infection in the apical region.

Table 6 shows the fees paid for prophylaxis for the boys and girls appears to be unduly small in comparison is due to two conditions other than the comparative absence of periodontoclasia in these younger groups. In the first place, a much larger proportion paid $2, and, of course, it was more difficult to get these children in regularly, because of sickness, holidays and, at times, the indifference of parents. In column 7, we have the average fee paid for restorative work a year and, in column 8, the total dental fee paid a year. This includes all operative and prosthetic service. Since

TABLE 5.—EXTRACTIONS OTHER THAN THIRD MOLARS

	Enrolled	With No Extractions	One or More Extractions	From Periodontoclasia	Pulpless + Health	Infected	Collapse or Accident	Irregularity	Exposed Pulp
School children (girls)	68	65	3	.....	1	.....	.....	1	1
School children (boys)	59	56	3	.....	.....	.....	2	.....	1
School teachers (women)	31	25	6	1	4	2	.....	.....	.....
Unmarried women	26	22	4	2	1	1	.....	.....	.....
Business women	105	85	20	11	23	4	.....	.....	1
Housewives	220	166	54	45	50	9	1	.....	.....
Business men	241	185	56	69	73	5	2	.....	.....
Those with six teeth or less	15	15	.....	.....	.....	.....	.....	.....	.....
Total	765	619	146	128	152	21	5	1	3

phylactic service and for operative or restorative service. Columns 2 to 5 show the number of patients in each group who paid $2, $3, etc., a visit for prophylaxis and examination. The length of these appointments was fifteen minutes, twenty minutes and thirty minutes. The very large majority, including those who paid $3 and most of those who paid $4, were on the twenty-minute list. In column 6, we have the average prophylactic fee paid a year by each patient, which included any necessary periodontoclasia treatment. That the amount for prosome patients required an unusual amount of dental service and some others had a type of dental service of a class demanding a much larger fee than the average, we have in the remainder of Table 6 omitted all those patients who paid more than $12 a year for restorative work. Column 9 shows the number of patients in this group; column 10, the average prophylactic fee a year; column 11, the average operative fee a year, and column 12, the total average yearly fee for dental service. Column 13 shows this total fee worked out on a monthly

basis, which means that, excluding the fifteen with six teeth or less, 70 per cent of the remainder of the whole list paid from 94 cents to $1.37 a month for dental service over the period of years that they were on the list. This is a small investment in consideration of the fact that pulpless teeth and extractions were largely eliminated and that the periodontal tissues were kept in a condition of health which was reflected in the general health of the patient. A number of our patients between the ages of 70 and 80 attribute their good health in no small degree to the care taken of their mouths.

Regular attention also permitted us to keep sharp edges from developing on the teeth and to watch the condition of the soft tissues. Some of these patients developed a leukoplakia due to smoking, but this was kept under control by calling the patient's attention to the seriousness of this condition and by instructing the patient as to its care. No condition of malignancy developed in the mouth of any of these patients as far as we know.

CONCLUSIONS

1. Our prophylactic list numbers 1,032 patients, in ages ranging from 5 to 81 years. This is the analysis of the record of 765 patients who have been on the list for more than two years and represents 4,452 dental years of service.

2. There were more than twice as many on the list with fair or poor gum conditions as with good.

3. Ninety-five per cent of all the patients on the list were called every three or every four months for prophylaxis and examination.

TABLE 6.—FEES

		Fees Paid by Whole Group								Fees Received from Those Who Paid Less Than $12 a Year for Operative Service				
		Fee Paid for Each Prophylactic Treatment												
	Enrolled	$2.00	$3.00	$4.00	$5.00	Average Prophylactic Fee	Average Operative Fee	Total Average Fee		Number in Group	Average Prophylactic Fee	Average Operative Fee	Total Average Fee	Total Average Fee Per Month
School children (girls)	68	19	48	1	.....	$5.89	$11.13	$17.03		49	$5.54	$6.14	$11.68	$0.97
School children (boys)	59	21	38	.....	.....	6.43	10.03	16.46		44	5.87	5.54	11.41	0.95
School teachers (women)	31	.....	27	4	.....	9.28	8.68	17.96		19	8.94	4.67	13.61	1.05
Unmarried women	26	.....	23	2	1	8.62	15.06	23.68		13	6.83	4.48	11.31	0.94
Business women	105	3	95	7	.....	8.69	9.60	18.29		88	8.63	6.30	14.93	1.24
Housewives	220	2	172	41	5	9.47	12.89	22.36		141	9.03	5.40	14.43	1.03
Business men	241	.....	170	63	8	9.83	12.89	22.72		173	9.58	6.91	16.49	1.37
Those with six teeth or less	15	2	10	2	1	9.33	48.51	57.84						
	765	47	583	120	15					527				

4. We have not been able to prove that the incidence of dental caries is materially reduced by regular dental prophylaxis, although we believe that such is the case.

5. Nearly 97 per cent of all patients had no pulp involvement while they were on the list, and the majority of those who had any could in no way blame the inefficiency of the system for the trouble. We therefore believe that pulp involvement can be practically eliminated by this procedure.

6. Eighty-one per cent of these patients had no teeth extracted (except third molars), and the majority who lost teeth lost them because of root-canal operations which had been previously performed, and extensive periodontoclasia which had developed previous to their being placed on the list. We believe that extraction of teeth due to caries or periodontoclasia can be for the most part eliminated by following a system of this nature.

7. In consideration of the fact that the average number of teeth missing in boys and girls, of an average age of 15 to 16, over a period of 622 dental years, is from 0.30 to 0.39; that, in business men and housewives, the average number of teeth missing is from 7.6 to 7.7, and that so few teeth are lost by all groups while on the prophylactic list, it is apparent that the business men and their wives would have saved far more of their teeth had they had access to such a service years before.

8. Traumatic occlusion was corrected in its incipiency and by regular prophylactic care periodontoclasia was largely avoided.

9. Malignancy was eliminated from the mouths of these patients as far as we know.

10. The mouths were kept in a condition of health which reacted favorably on the general health.

11. Among sixty-eight school girls, thirty-nine (57 per cent) had no roentgenograms taken while on the list; nineteen (28 per cent) had one or more, and ten (14 per cent) had one or more bite-wing films taken. The majority of the pictures were not taken for the purpose of locating caries. Considering the small percentage of teeth which were extracted, or required a root-canal operation, we conclude that, while the roentgen rays are a very valuable aid in dental diagnosis, their universal use at regular intervals, to locate caries, is economically unsound for the average patient.

12. Seventy per cent of all the patients paid a total dental fee of slightly above or slighly below $1 a month over the period of years that they were on the prophylactic list.

314 Somerset Building.

FUNCTIONS AND FINDINGS OF THE COMMITTEE ON THE STUDY OF DENTAL PRACTICE OF THE AMERICAN DENTAL ASSOCIATION*

By GUY S. MILLBERRY, D.D.S., San Francisco, Calif.

THE problem which we are to discuss this morning is so complicated and has so many ramifications that it is indeed difficult to know where to begin. Arising out of an unorganized revolt on the part of laymen against the rising costs of sickness, this problem led some one to suggest, prior to 1928, that a study be made of the costs of medical care. I do not know who made it, but officially it came through Ray Lyman Wilbur, Secretary of the Interior. It is undoubtedly one of the most important of the economic studies that have been made, chiefly because so little is known of the economic aspects of the practice of medicine.

When the plan to study this question was set up, provision was made for the inclusion of dentistry. The only dental representative on the executive committee for a time was Alfred Owre, of Columbia University. Later, Arthur D. Black was called to assist in the organization of the dental study and, finally, H. E. Phillips, of Chicago, and C. E. Rudolph, of Minneapolis, were added to the executive committee.

It was soon discovered that without the cooperation of the members of the various associations little could be done in rendering a health service. The American Medical Association, the American Dental Association, the National Tuberculosis Association, the Nurses' Association, the Metropolitan Life Insurance Company and the National Bureau of Economic Research were asked to participate.

Some associations graciously accepted, others did so with great reluctance and no enthusiasm. The American Medical Association was opposed to the issue at first, but finally entered into the project. Some of its reports will be off the press this month. A great deal depended on the American Medical Association because this group of persons constitutes the only reliable source of information regarding the costs of medical practice. Their intimate association with hospitals and clinics also made it necessary that the information which they possess be made available.

The American Dental Association accepted the invitation and immediately proceeded to the task. The Committee on the Study of Dental Practice, with H. E. Phillips as chairman, was set up, funds were provided and a staff was organized.

Four reports have been issued by this committee:

1. "The Cost of Equipping a Dental Office," of value to recent graduates;

2. "A Study of Dental Clinics in the United States: 1930," of particular value to those interested in that problem.

*Read before the Section on Economics and Office Management at the Third Triennial Session of the Pacific Coast Dental Conference, Seattle, Wash., July 8, 1932.

3. "The Practice of Dentistry and the Incomes of Dentists in Twenty States: 1929," the most comprehensive work on this subject yet produced;

4. "The Way of Health Insurance," a study of the European problem with some deductions and comparisons with the situation in this country.

The report on "The Practice of Dentistry and the Incomes of Dentists in Twenty States" presents data unique in the dental field. The information was obtained from about 6,000 dentists, the manner of their choice having been to select every fourth name in the address list of one of the popular dental magazines, which is distributed gratuitously to the profession. As not all of the questionnaires were returned nor did all of these dentists answer all of the questions, certain variables enter into the findings. Further, none of the reports were signed, so that it is unlikely that even the dentist who filled out a questionnaire would recognize his own if a copy were returned to him. The survey dealt with the problems of practice during the year 1929.

While the question concerning (1) the total number holding dental or other degrees; (2) the total number engaged in general practice or as partial or complete specialists; (3) the total number that had pursued graduate study; (4) the number holding salaried positions, and (5) the length of time of practice in a given community, are of general concern, they do not awaken the interest of the profession to such a marked degree as do the chapters dealing with incomes of dentists.

Before proceeding with the discussion of that phase of the study, I should like to touch for a moment on the section dealing with the attitude of the practitioner toward children's dentistry. Judging from the almost universally expressed opinions of dentists regarding service for children, it seems strange that 99 per cent of those reporting in this survey include children's work in their practice. Of this number, 25 per cent added their comments on this phase of dentistry. Half of the latter group "take the position that the work with children is important and not more objectionable than the treatment of adults; the other half, however, express their objection to this type of work although economic pressure makes it impossible for them to exclude children from their practice." This would imply that even though the majority of the dentists do children's work, not more than half of them enjoy it.

Since the question of income in dentistry is of paramount interest at the present time, let us consider the gross and net incomes of the dentists reporting in 1929 and compare the average modal, the average median and the average mean incomes of dentists in the various states. Some criticism has been offered by the dental profession in relation to this phase of the report, many contending that the statements are not true and that the figures are erroneous. I cannot but believe that we have more accurate data on these questions in this report than we have ever had. From these data, we are perfectly justified in drawing some deductions.

The gross modal income[1] for all of the

1. Modal incomes are those which appear more frequently than any other. In this report, they are classified in thousands of dollars from $1,000 or less to $15,000, then $20,000, $25,000, $50,000 and $100,000 or over. Mean incomes (arithmetic mean) are determined by adding the incomes reported and dividing by the total number of dentists reporting. Median incomes are those just half way between the highest and the lowest incomes reported.

states was between $4,000 and $5,000 a year; 12 per cent of the 5,493 reporting this amount. The gross modal income for California was between $7,000 and $8,000 a year; the gross modal income for Washington was between $5,000 and $6,000 a year, and the gross modal income for Colorado, whose state dental association meeting I recently attended, is between $3,000 and $4,000 a year. Colorado then falls below the average for twenty states by $1,000 a year, Washington is above the average by $1,000 a year and California is above it by $3,000 a year.

For comparison, we find that the net modal income for all of the states is between $3,000 and $4,000 a year; for California, between $4,000 and $5,000 a year; for Washington, between $3,000 and $4,000 a year, and for Colorado, between $2,000 and $3,000 a year.

The gross and net mean incomes and the gross and net median incomes are equally interesting. The gross mean income for all states was $8,279. (The total number reporting is not given.) In California, exclusive of San Joaquin County, the gross mean income was $10,257; in Washington, $7,292, and in Colorado, $6,756. The net mean income for all states was $5,011; California, $5,722; Washington, $4,628, and Colorado, $4,330.

California dentists evidently spend more in carrying on their practices, if these figures are accepted as the average, because they show that approximately 60.5 per cent of the mean income of all dentists is net (exclusive of salary allowance for self), while California dentists' records show but 55.8 per cent to be net. Washington dentists have a higher percentage of net income, 63.5, and Colorado exceeds this, with 63.9.

The figures for the median incomes give for all states $6,615 gross and $4,094 net. California again takes the lead in the averages in these three states, with $7,870 gross and $4,750 net. Washington dentists show $5,980 gross and $3,850 net, while Colorado figures show $5,790 gross and $3,660 net. The relationship of net median income to gross median income in this report shows for all states 62 per cent; for California, 60 per cent; for Washington, 64 per cent, and for Colorado, 63 per cent.

Of course, all of these figures are averages; but for purposes of comparison, they express definitely some of the problems of professional practice with which we are all concerned. In the first place, the profession should know more about what it costs to conduct a dental practice than it does at the present time; secondly, it should know what its clientele in the various states is able to pay for dental service, because, in the last analysis, it is the purchasing power of the people that must be depended on for its income, and thirdly, it must realize what its net income should be to sustain itself in an appropriate position in society.

Since good dental service, especially of the preventive type, is of great importance to the public, the public should not be allowed to forget that those who render this service are entitled to a standard of living commensurate with their value to the community.

Unfortunately, the various efforts being made at the present time to restore the economic status of the dentist instantly have taken the form of attempting to induce the people to come to the offices of the dentists, who will thus be given an opportunity to "sell" dentistry to them. My convictions are that such a

plan is futile and will react unfavorably for the profession.

I would recommend in lieu thereof that every effort be made to educate the public regarding the value and importance of sound teeth and healthy mouths and good dental service. This has been a kind of general policy in California for the last twenty years. In my opinion, it explains the higher average incomes in that state.

There are some things in this report worth the consideration of the older dentists: 1. The peak of practice usually occurs between the fifteenth and twentieth year after graduation, although, in the larger cities, it usually falls about five years later. Therefore, the dentist who has passed this period should look well to the remaining years of active practice, especially at a time like this when return to normal economic conditions is likely to be retarded. 2. In virtually every locality, the complete specialists are earning higher incomes than the partial specialists and both of these are earning higher incomes than the general practitioner. One should not lose sight of the fact that it takes about 100 general practitioners to maintain a good practice by reference for an oral surgeon and exodontist and that at least ten general practitioners are necessary to sustain a practice for an orthodontist, who practices nothing but his specialty. Many general practitioners are now undertaking work in special fields, owing to the dearth of patients, and some specialists are returning to general practice for the same reason.

If the opinions of the dentists reporting on the probable incomes of their patients are well founded, the dental profession must take cognizance of the fact that less than 6 per cent of their patients have incomes above $6,000 a year and that not more than 13 per cent have incomes between $3,000 and $6,000 a year. This would imply that 87 per cent of the people who go to private practitioners have less than $3,000 a year. Where this represents a family income, it does not permit the expenditure of large sums of money for dental service annually.

May I now discuss the health insurance or social insurance problem?

It is quite generally recognized that low wages are the basis upon which the whole social insurance program is built. When the income is at the subsistence level, it is possible for the individual to exist; when it falls below this, poverty follows—a social problem—and this leads to sickness—a health problem.

It is impossible for a person earning small wages to provide good health service for a family, under present conditions. In most countries, this has resulted in a program of health insurance, compulsory in twenty-four countries now and voluntary in eighteen others. The United States is the only large country without it.

According to some economists, this has been brought about by the great tendency toward industrialization in the last four or five decades. Great bodies of propertyless workers, dependent on wages, have gathered in industrial centers where the vagaries of the market, overproduction, unemployment and industrial accidents influence their lives. In communities where a single line of industrial activity is predominant, a slump in the market in this particular field causes lowered wages or loss of employment, resulting in strikes and other forms of industrial disturbance.

Social insurance is looked on as a panacea for this condition in some countries. This may be divided into unemployment insurance and health insurance. When-

ever and wherever an adequate wage scale can be established, the responsibility of meeting all the costs of living and providing for the future and for emergencies is immediately transferred from society to the individual.

There are four developments in dentistry in countries where health insurance prevails: (1) preventive and curative service; (2) discovery of the relation of mouth disease to body disease; (3) progress in prosthesis, and (4) progress in children's dentistry. These are practiced in accordance with the demand from the controlling groups.

Eligibility for participation in the benefits of this service in various countries is based on gross income. In Germany, workers at $858 a year, nonmanual at $643 a year; in France, city dwellers at $705 a year, country dwellers at $588 a year; in Great Britain, between the ages of 16 and 65, $1,215.

Health insurance may have been set up as an expedient to meet an emergency. It is reported that, in Germany, Bismarck realized that social insurance would cripple the Socialist movement and therefore urged it, thus meeting an emergency.

There is a great surplus of doctors and dentists in Germany and Hungary. The battle between the societies and the physicians has been going on for fifty years. If physicians employed by the societies prescribe extravagantly, they are often forced by the organizations to repay excessive costs.

In 1929, the total expended for dentistry in Germany under the health insurance plan was $20,000,000 for 40,000,000 people, or 50 cents per capita.

There are four classes of dentists in Germany: (1) *Zahnarzt,* the diagnostician, with full medical training and little technical experience; *Dentiszt,* the men trained clinically for one year; *Zahntechnicker,* the apprentice or technician, and *Kurpfuscher,* the charlatan. Members of all of these groups are employed under the health insurance program.

The International Labor Conference is constantly urging compulsory health and social insurance. At this conference, no medical delegates are allowed. Only delegates from labor, from the employer group and from the government are seated, and yet health insurance requires the services of the medical profession. While labor is represented at these conferences, it is usually represented by a small minority of the officials of the labor group.

It is evident that the control of most forms of health insurance is passing into the hands of the governments, a condition with which the professions as a rule are not in sympathy.

As a result of the inauguration of these health insurance programs, every phase of the lives of physicians and dentists has been profoundly altered. The income, the method of payment for service, the relations with patients are all changed.

Health insurance is finding its way into America through many channels of social and industrial endeavor. Hospital associations have long been in existence; industrial welfare health units have cared for employes in many plants; trade unions, mercantile establishments, banks, health centers have all contributed something to the program, and, finally, we have workmen's compensation insurance (compulsory in forty-four states) and private health insurance for those who can afford to buy it.

I have been told that it would not require much in the way of an amendment to the workmen's compensation insur-

ance laws to provide health insurance for the group thus protected. It might be a very simple thing to effect such a transfer of social responsibility through our legislatures.

The medical group are almost universally ignorant of or indifferent to social, economic or political changes which affect their professions. They have preached and practiced individualism too long to be able to control their members in an economic fight. On the basis of centuries of experience, they oppose any change. The members must first be educated in the things which underlie economic action.

Medicine has a monopoly of the knowledge needed for the proper treatment of disease; it is concerned with the health of the worker. Yet it has never proposed any alternative plan for health insurance.

The absence of leadership and effective planning has caused the greatest loss to the professions. Because they have not taken hold of this problem, it has been charged that they are only interested in professional dignity and salary. A few years ago, dentistry was plunged into the struggle. It has not known what to do and has had little to say except to protest.

The report, from which I have quoted freely, gives a complete review of the conditions in Europe and submits some interesting recommendations. Every dentist should know something about this problem, and in each association or component society, a committee composed of those men who are most interested in social and legal questions should be appointed to investigate these matters thoroughly and to keep the society well informed.

In virtually every country where social or health insurance exists, except in France, the medical and dental professions have nothing whatsoever to say about the program, except by protest. Most of these programs have developed through legislative activity, and, in a conflict of anything like unequal forces such as these, legislation will be shaped by those who know best what they want and how to go about getting it.

It therefore behooves the dental profession to prepare itself either to formulate legislation of this character or to protect itself against the passage of laws which may be inimical to public and professional welfare.

May I urge you to acquaint yourselves with every aspect of this question.

LEUKOPLAKIA OF THE ORAL MUCOSA*

By LESTER HOLLANDER, M.D.; HOWARD H. PERMAR, M.D., and LEO SHONFIELD, D.D.S., Pittsburgh, Pa.

THE ever-increasing interest of the dental profession in pathologic lesions of the soft tissues of the mouth; the relative frequency of leukoplakia as a representative of this group of disorders, and the apparent confusion which exists concerning it; the importance which leukoplakia assumes from the standpoint of prognosis; the fact that progressive changes within the lesion may result in the formation of a carcinoma of the mouth; the practical experience as regards the therapeutic difficulties which arise when its eradication is attempted, and the multiplicity of etiologic factors which may be responsible, alone or in combination in its production, are among the reasons for the following discussion.

The term "leukoplakia," derived from the Greek; *leukos,* white, and *plakos,* tablet, is descriptive of the principal features of the appearance of the lesion under consideration. The color white and its various shades of gray play an important rôle as an objective sign in disease of the mucous membrane. It assumes the relative importance of red and its variants, as this color marks the underlying pathologic process of the skin. The reason for this is found in the fact that, in the normally pink mucous membrane, inflammatory changes producing reddened areas are not easily discernible, and thickening or denudation of the mucous membrane manifests itself, in addition to other less noticeable objective signs, by the appearance of a whitish discoloration.

No area of the oral mucosa is free from pathologic changes leading to leukoplakia. Designatory terms of location are found in the literature as follows: When the lesion is on the lip, it is called leukoplakia labialis (Fig. 1); on the buccal mucosa, it is called leukoplakia buccalia (Fig. 2); and on the surface of the tongue, it becomes leukoplakia linguae (Fig. 3).

Confusion has been added by the frequent use of one of the following synonyms: leukoplasia, leukoma, psoriasis linguae, buccal psoriasis, smoker's patch, ichthyosis lingual, tylosis linguae, hyperkeratosis buccalis vel linguae, plaques blanches de la bouche, leukokeratosis and plaques opalines.

CLINICAL DESCRIPTION

As both the subjective and the objective symptoms vary according to the duration, the severity and the stage of the disease; it will be necessary to describe leukoplakia accordingly.

Occasionally, for weeks or months before the appearance of any objective symptoms, there occurs a sensitivity of the oral (including the lingual) mucosa as a reaction to irritation produced by the ingestion of food or after the use of tobacco. At times, nothing unusual but

*From the Pittsburgh Skin and Cancer Foundation.

a metallic taste or a sensation of dryness is noticed by the patient.

Most frequently, there are no prodromal symptoms, and the discovery of the lesion becomes purely accidental, the area of roughness in the mouth either being seen or accidentally felt. The objective symptoms of the early lesions vary. At times, these lesions appear as pale pink spots which fade into the surrounding mucosa without any sharp demarcation, while, at other times, the appearance is that of a whitish spot which is but slightly elevated above the surrounding mucous membrane, and if several of these spots are present, it looks as though a weak solution of silver nitrate had been carelessly streaked across

Fig. 1.—Leukoplakia labialis.

it. As the lesions age, they become thicker, firmer, more pronounced and more sharply demarcated. Rarely, a faint inflammatory halo of about 1 mm. in width separates the lesion from the rest of the mucosa.

The next step in the alteration of the objective symptoms occurs when, through peripheral extension, separate lesions of leukoplakia coalesce to form an oval, a rounded or an elongated or even irregular flat plaque of varied thickness, this depending naturally on the age and progression of the coalescing lesions. As the plaque ages, it becomes thicker and assumes a leathery appearance. At times, filiform wartlike prolongations form, which increase the roughness of the lesion. At this stage, the plaque becomes sufficiently inelastic that, through motion, a fine splitting may occur on its surface, and, at the same time, at its margins, a slight separation or lifting up may be noted. (Fig. 4.) As a result of this, pieces of the plaque may become torn loose. This results in the formation of rhagades or fissures as the tear extends into the underlying corium. Hemorrhages of minute character occur at this stage, which change the color of the lesion to a more yellowish or brownish hue, but soon the white will reestablish itself.

The next step in progression is that

Fig. 2.—Leukoplakia buccalis; showing triangular formation.

of ulceration. (Fig. 5.) When this is established, the lesion will, in most instances, become painful, not only on ingestion of irritating foods, but even on talking. The process, if it continues, may go on into an infiltrating tumor or a true carcinoma.

Although the description given above visualizes this process, there are many factors which have to be specifically discussed.

1. *The Color of the Lesion.*—This is a variable factor. The lesion does assume a shade of white, and, being opalescent, this resembles a milky whiteness.

We have observed, as have others, lesions of grayish or grayish white character, and as noted above, because of small hemorrhages, yellowish or even brownish hues. Artefacts may enter in in the form of chewing tobacco, ingested food or pigmented candy, which will change the original color of the lesion. Before the establishment of rhagades or the filiform wartlike prolongations, the lesion carries the gloss of mother-of-pearl. In a great many instances, as it progresses, this becomes imperceptible.

2. *The Shape of the Lesion.*—This is the next objective sign which requires special description. Usually, it is an elongated (Fig. 2), somewhat ovoid

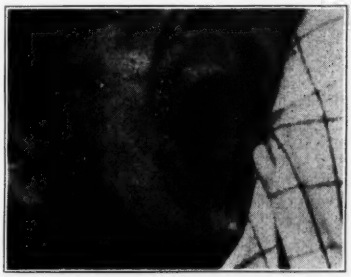

Fig. 3.—Leukoplakia on woman's tongue.

plaque, but it may be oval, rounded (Fig. 4) or irregular, and in one particular location, namely, the commissure of the mouth, it assumes a triangular appearance with the apex of the triangle at the angle of the mouth (Fig. 2).

3. *The Size of the Lesion.*—This is also variable, ranges from that of a small split-pea to an extreme case observed by us which covered two-thirds of the oral mucosa.

4. *The Location of the Lesion.*—Lesions of leukoplakia may be found in any location on the oral mucosa. Areas of predilection for its localization have been noted by practically all observers. The anterior portion of the dorsum of the tongue at its tip or on the margin, the inner surface of the cheek in the so-called interdental area and the lower lip are the regions which other observers find most frequently involved. To the foregoing, we would add the mucous membrane opposite the angle of the jaw (Fig. 5).

Although not pertinent to this particular presentation, we would like to call attention to the fact that leukoplakia occurs in other locations than the oral mucosa, namely, the esophagus,[1] the vaginal mucosa, the endometrium of the

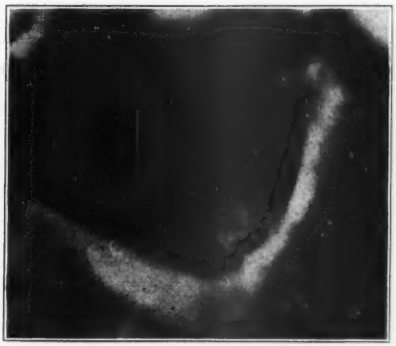

Fig. 4.—Case showing lifting up of margins of leukoplakia patch.

uterus, the bladder mucosa and the pelvis of the kidney.

AGE AND SEX INCIDENCE

The most frequently observed age period is that of the sixth decade, but instances from the age of 20 have been reported in the literature. The overwhelming majority is seen in men, but it is not so rare in women as has been supposed (Fig. 3).

1. Adami, J. G., and Nicholls, A. G.: **Principles of Pathology, Vol. II: Systemic Pathology,** Philadelphia: Lea & Febiger, 1911, p. 408.

THE COURSE

Extreme chronicity, slow development and persistence are highly characteristic of this condition. Lesions may appear almost stationary over a long period of time. We have noted that those which are associated with what we later shall describe under galvanic burns and those which are frankly the result of syphilis develop much faster and clear up with greater rapidity than the other types.

ETIOLOGY

The exact cause of leukoplakia is unknown, but there appears to be evidence that both local irritation and systemic disturbance may play a part in its production.

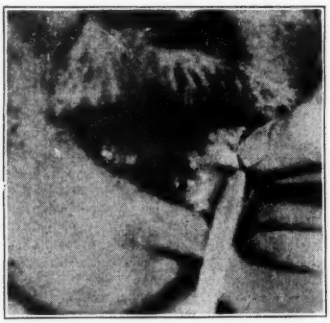

Fig. 5.—Case showing ulceration.

SYSTEMIC CAUSES

Among systemic disturbances, syphilis stands out preeminently. Schoengarth[2] found syphilis demonstrable in 65 per cent of cases; Landouzy,[3] in 58.1 per cent of cases. Guszman[4] put the figure at 94.8 per cent. Hazen[5] believed it highly probable that there is a syphilitic basis in the production of leukoplakia. Pusey[6] summarized the etiology in the following statement: "All the etiological factors are unknown. The most important underlying cause is syphilis. When it follows syphilis, it is probably the result of areas of irritable mucous membrane lef. in the mouth at the site of previous syphilides, especially mucous patches." Zinsser and Stein[7] state: "Although there is no doubt that leukoplakia is not exclusively a syphilitic lesion, nevertheless there is also no doubt that syphilis in a great measure predetermines conditions for its occurrence, and that an especially high percentage of those who suffer from leukoplakia are syphilitic." Howard C. Taylor[8] con-

Fig. 6.—Tumor developing from area of leukoplakia which resulted from the wearing of badly fitting dental plates for twenty-five years.

2. Schoengarth: Inaugural Dissertation, Breslau, 1896.

3. Landouzy: Bull. Acad. de méd., Paris, 1908, No. 25.

4. Guszman: Orvosi hetil. (Hung.), 1908, Nos. 36-38.

5. Hazen, H. H.: Diseases of the Skin, Philadelphia: W. B. Saunders Co., 1911, p. 398.

6. Pusey, W. A.: Principles and Practice of Dermatology, New York: D. Appleton & Co., 1924, pp. 1208-1211.

7. Zinsser and Stein: Diseases of Mouth, New York: Rebman Co., p. 56.

8. Taylor, H. C.: Cancer, Philadelphia: Lea & Febiger, 1925, p. 51.

sidered syphilis as one of the two important etiologic factors. Elliott and Stookey[9] emphasized the association of neurosyphilis with buccal leukoplakia. In a series of fifty cases of neurosyphilis, only one showed a normal mucosa of the oral cavity. Howard Fox,[10] in an excellent article, considers syphilis as one of the factors in its production.

In contrast, there are those who ascribe much less importance to syphilis as an etiologic factor. Bonnett[11] attacked this particular theory, as did Montpellier.[12] Hazen and Eichenlaub[13] considered that syphilis represents an accidental rather than a causative factor.

Fig. 7.—Leukoplakia caused by red vulcanite plate.

In our experience, syphilis has played an important part, and the treatment of the patient in the presence of demonstrable syphilis is always influenced by this fact.

Other constitutional factors can be listed as neurasthenia, as noted by Strumpell,[14] gouty diathesis, as noted by Schamberg,[15] and diseases of the stomach and intestines, as emphasized by Kummell.[16]

LOCAL CAUSES

Among the local causes are the following: The use of tobacco, which assumes the important rôle, and with the exception of Bonnett and of Strumpell, who makes the astounding statement that the disease has no relation to excessive smoking, justifying himself by recording the observation that he has seen the condition in women, all authors agree as to its great etiologic importance. Both chewing and smoking can produce it. The influence of smoking is partly the burning and partly irritation from the products of combustion (Taylor).[8]

The excessive use of alcohol.

The presence of rough and jagged teeth. These tear at the adjacent mucosa and are responsible for a certain number of lesions, especially those occurring on the margin of the tongue and the lower lip.

The presence of decayed, infected teeth, acting in the manner of adjacent chronic microbic irritation, and bad oral hygiene.

The ingestion of very hot or highly spiced foods.

Trauma, especially of the type of the nervous habit of biting the cheek (Szabo).[16]

The presence of badly fitting dental

9. Elliot, B. L., and Stookey, P. F.: M. J. & Rec., 119:138 (June 4) 1924.

10. Fox, Howard: J.A.M.A., 85:1523 (Nov. 14) 1925.

11. Bonnett: Ann. de dermat et Syph, 1918, p. 597.

12. Montpellier, J.: Ann. d mal. vén., November, 1920.

13. Hazen, H. H., and Eichenlaub, F. J.: J.A.M.A., 79:1487 (Oct. 28) 1932.

14. Strumpell, Adolf: Textbook of Medicine, Vol. I, New York: D. Appleton Co., 1912, pp. 476-477.

15. Schamberg, J. F.: Diseases of Skin, Philadelphia: P. Blakiston's Son & Co., 1925, pp. 534-536.

16. Kummell & Mikulitz: Die Krankheiten des Mundes, Jena: Gustav Fisher, 1922, p. 6.

plates (Fig. 6 and Fig. 11 [photomicrograph of lesion]).

Irritation produced by red vulcanite plates (S. V. Mead[17]) (Fig. 7).

A leukoplakia may also be caused by electric currents set up by different metals used for "stopping teeth and in the formation of tooth plates," as observed by Duncan C. L. Fitzwilliams.[18] To show that electric currents can produce leukoplakia of the tongue, he records a history of such a lesion in a man, aged 40, who was a chief of telephone service. For a great number of years, he was in the habit of testing currents with his tongue, applying the two poles to either side of the tongue. The currents usually dealt with were from 8 to 12 volts, so that a current of 50 to 100 miliamperes passed through his tongue several times a day. At these points, the patient's tongue presented two areas of leukoplakia.

Lane[19] deserves the credit of calling to the attention of the American dermatologists the fact that galvanic burns of the oral mucosa might occur as the result of the presence of various metals which are used in fillings, fittings and dentures, the saline content of the saliva furnishing the electrolyte for this galvanic battery.

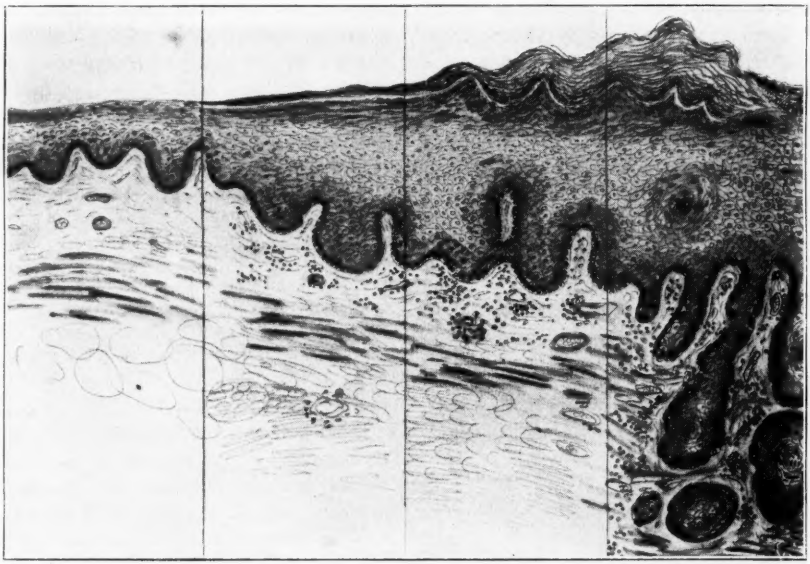

Fig. 8.—Schematic drawing showing how leukoplakia may undergo carcinomatous degeneration.

One of us (L. H.[20]) has reported

17. **Mead, S. V.: Diseases of Mouth, St.** Louis: C. V. Mosby Co., 1927, p. 357.

18. Fitzwilliams, D. C. L.: Tongue and Its Diseases, New York: Oxford University Press, 1927, pp. 149-162.

19. Lane, E. S.: Chemical and Electrolytic Lesions, Arch. Dermat. & Syph., 25:21-32 (Jan.) 1932.

20. Hollander, Lester: Galvanic Burns of Oral Mucosa, J.A.M.A., 99:383-384 (July 30) 1932.

one case of leukoplakia occurring on the tongue. It was rapid in its formation, and it disappeared when a permanent dental fitting, which replaced an extracted lower right first molar, was removed. In addition to this fitting, the patient has several amalgam fillings. To further prove the correctness of this contention, the apparatus was replaced, and in fourteen days, an exact replica of the original area of leukoplakia on the tongue recurred. Ten days after the second removal of this fitting, without any other medication, the lesion again totally disappeared.

It seems to us that a chronic irritation set up by these minute but registerable electric currents might play an important rôle in the production of leukoplakia, as two other instances have come under our observation in the last three months.

REPORT OF CASES

Case 1.—Mr. A. H., aged 47, came in for treatment because of several patches of leukoplakia, occuring in the following areas: first, on the lower left ridge distal to the third molar; second, on the upper left ridge distal to the third molar; and third, on the area opposite the upper third molar on the buccal mucosa. The accompanying roentgen-ray films show that practically every tooth was filled. Some of these fillings were made of

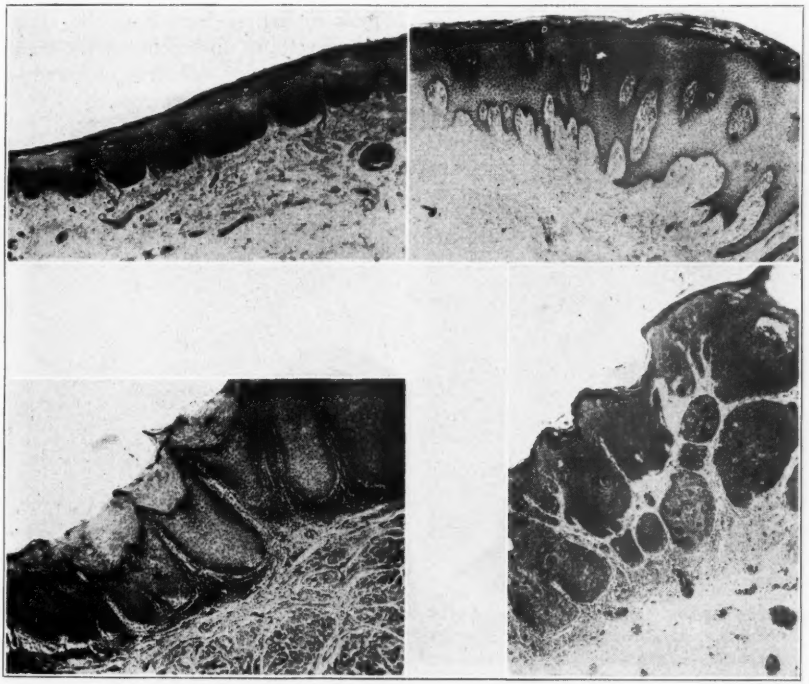

Fig. 9.—Progression from normal mucosa to carcinoma. Above, left, normal mucosa; right, early leukoplakia. Below, left, advanced leukoplakia; right, carcinoma developing from leukoplakia.

amalgam and some of malleted gold foil, the first mentioned material being used in bicuspid and molar teeth, while the latter was utilized in the anterior teeth. One tooth, the upper left first bicuspid, carried one of each type of these filling materials.

In addition to the objective signs of leukoplakia, the patient described dryness of the mouth and a peculiar metallic taste. It may be observed here that, in the two other patients previously referred to, this metallic taste was also present.

Case 2.—Mr. G. R., aged 42, presented a marginal glossitis involving the tip and anterior fifth of the margin of the tongue. In addition, there were noted five depressed, faceted areas covered by a persistent grayish membrane which was not detachable and

Fig. 10.—Lichen planus.

which, on further examination, we found to be a leukoplakia. This condition was of about 16 months' duration and associated at times with marked burning of the tongue, at times with a peculiar metallic taste. Opposite this involved area of the tongue, in the upper jaw, five gold-crowned teeth could be observed in exact apposition to the pathologic areas described on the tongue. These gold crowns were placed in the mouth about eighteen months previously. There was no question as to the causal relation here, as, following the removal of these fittings, the lesions disappeared. Careful electrical measurements have been made in this patient and will be the subject of a later report.

RÉSUMÉ OF ETIOLOGY

We have observed patients in whom, after treatment for syphilis, local areas of leukoplakia have disappeared, and we also have patients in whom the withdrawal of tobacco in all forms was followed by the disappearance of the so-called smoker's patches. Especially is this true of the lesions occurring on the lower lip and on the tongue. We have records of four patients in whom, after the removal of dissimilar metals from the mouth, lesions of leukoplakia disappeared. We also have records of two

Fig. 11.—Lichen planus annularis, resembling leukoplakia linguae.

patients who presented leukoplakia of the lower lip, both of which cases were of several months' standing, and the lesions were slowly progressive. After correction of rough, jagged and pyorrheic teeth, the lesions of leukoplakia disappeared of their own accord.

In all these instances, no other treatment was carried out, which would strongly point to the definite discovery of pertinent etiologic conditions. In the vast majority of instances, as a great

many factors are found which must be considered etiologic, we are convinced that tobacco, jagged, uneven and abraded teeth, spices, and galvanic burns frequently act conjointly, and that, in the presence of demonstrable syphilis, which occurs in a fair number of patients, a state exists locally in the mouth which in some way predisposes to leukoplakia.

There is one other type of leukoplakia to be considered from the etiologic standpoint; that is, the one which offers no discernible causative factor; and it is often this type which is most recalcitrant to treatment.

Fig. 12.—View of lesion, showing annular character (lichen planus annularis).

Fig. 13.—Mucous patches (secondary syphilis).

We further agree with the experience of many authors, notably Fitzwilliams,[18] that there is some other factor of which we are unaware in the production of leukoplakia, as "some people can do or suffer all these things and yet never develop leukoplakia, while others who never had syphilis, are nonsmokers, teetotalers, and never take spiced food may be seen with it." We only wish to add to this quotation the remark that the esophagus, vagina, uterus, bladder or the pelvis of the kidney are not subjected to the usual local irritations of the mouth, and may develop leukoplakia when syphilis is not always demonstrable. Chronic inflammation, with or without mechanical irritation of one type or another, is associated with leukoplakia in these various locations.

PATHOLOGY

As the normal histologic structure of the oral mucous membrane shows layers similar to that of the skin, with the exception of the absence of complete cornification, which will be described later, and the absence of epidermal appendages such as hair follicles, we find on a well-defined corium, which is made up principally of connective tissue structure to support blood vessels, nerve endings and lymphatics, the following layers of epidermis going from within outward:

1. The stratum germinativum, or the basal layer. This is composed of a single

row of elongated cells which rest on the corium and from which all the upper epithelial cells arise.

2. The rete mucosum of the prickle cell layer, which is above this and is composed of about four rows of polygonal cells with protoplasmic prolongations forming bridges between these cells, and giving the individual cells a prickly-pear appearance; hence, the name "prickle-cell" layer.

3. Above this, a layer composed of two or three rows of cells containing granules of keratohyaline substance; known as the granular layer.

4. The stratum lucidum, or the translucent layer, the cells of which contain eleidin. This layer is usually not distinguishable except when the mucous membrane becomes thickened.

Fig. 14.—Sclerosing glossitis (tertiary syphilis).

5. The uppermost layer, the so-called stratum corneum, composed of laminated or flat epithelial cells similar to that of the uppermost layer of the skin. This does not reach the strength and thickness of the latter, and there is missing principally the compactness of cornification.[21] Only on the dark portion of the lips and the dorsum of the tongue does this occur sufficiently to be mentioned, but, even here, nuclei are found in the uppermost layers of cells, which, in the skin, except under pathologic processes, are entirely absent in the horny layer.

The epithelial lining differs in various portions of the mouth. On the inner surface of the lips and on the floor of the mouth, it is the thinnest; while, on the dorsum of the tongue and at the subgingival margin, it is thickest.[16]

Three important and noticeable changes occur in the mucous membrane when a leukoplakia patch is formed[22]:

1. The completion of cornification and the piling up of the cornified stratum corneum, which is known as hyperkeratosis.

2. Thickening from the increase in the number of rows of cells in the rete mucosum or malpighian layer with the flattening of the rete pegs which dip down into the underlying corium, this process being known as acanthosis.

Fig. 15.—Fordyce's disease.

3. A widening of the blood vessels in the corium and the infiltration of the papillary layer of the corium by leukocytes or white blood cells. These changes are progressive. The earliest concern themselves chiefly with hyperkeratosis. As the lesions become more chronic, and as they progress clinically, these features

21. Maximow, A. A.: Textbook of Histology, Philadelphia: W. B. Saunders Co., 1931, p. 463.

22. Footnote 16. McCarthy, Lee: Histopathology of Skin Disease, St. Louis: C. V. Mosby Co., 1931, pp. 452-454.

will manifest themselves more and more pronouncedly.

We are submitting a schematic representation of this process, carrying it far enough to show how leukoplakia may undergo carcinomatous degeneration, which is the essential reason for this extensive description.

The schematic picture (Fig. 8) is divided into four sections. *1* shows the normal mucosa. *2* shows early hyperkeratosis, early acanthosis and early infiltration of leukocytes into the corium. These pathologic processes are more exaggerated in *3,* and *4* shows marked invagination of the rete pegs and

Fig. 16.—Thrush.

marked cellular infiltration of the corium. This schematic picture is supplemented with microphotographs showing the same conditions. (Fig. 9.)

DIFFERENTIAL DIAGNOSIS

Although the well-established case of leukoplakia offers little or no difficulty in diagnosis, there are a number of instances in which careful examination and detailed observation are necessary to differentiate it from other lesions of the oral mucosa. At times, even histologic examination will not be sufficient for definite diagnosis of the lesion under suspicion.

Diseases to be differentiated are as follows:

1. Lichen planus. This is a disease which usually affects the skin and the oral mucosa similtaneously. There occurs on the body, especially at the wrists, on the forearms, on the lower extremities and, at times, over the entire body, a reddish or violaceous hued papular eruption. The papules tend to be polygonal and to follow the lines of skin trauma, and are very pruriginous (itchy). When observed in an oblique light, they present a very peculiar shine. Concomitantly, on the buccal mucosa, there appears

Fig. 17.—Lupus erythematosus of lip.

bilateral white striae, presenting here and there small nodular swellings in their course. At times, lichen planus of the oral mucosa occurs alone, without skin manifestations, in which case the differential diagnosis, of course, becomes much more difficult.

Highman[23] states: "Leukoplakia resembles lichen planus, but on study no papules are seen and the white is sheerer than in lichen." Brocq[24] relies apparent-

23. Highman, W. J.: Dermatology, New York: The Macmillan Co., 1921 (Fig. 74).

24. Brocq, A. J. L.: Presse méd., 27-277 (May 22) 1919.

ly on the above described nodular swellings in the course of the white striae as they occur on the oral mucosa. He also states that there is often a certain degree of atrophy in lichen planus.

Our observation (Fig. 10) leads us to believe that, in lichen planus, the individual lesion is always a grayish white rounded pinpoint nodule and, as the disease progresses, a veritable network of these papules produce a spider-web appearance by the crossing and recrossing of these punctate and linear striations.

In the annular type of lichen planus, there is a rounded wavy, circular lesion with a central area of scarring, the edges of which are made up of multiple minute

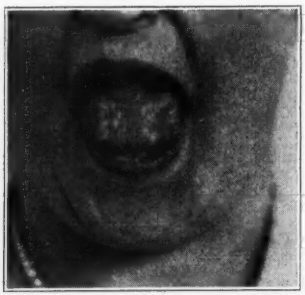

Fig. 18.—Lupus erythematosus of tongue.

papules, white and confluent. On close examination, an individual papule can be discerned. We are mentioning the annular type of lichen planus because, on the tongue, the central unaffected area may not be present and the lesion may simulate an atrophic type of leukoplakia, as the accompanying picture indicates (Fig. 11). The diagnosis in this case was based on the presence of the clear central area in the lesion which occurred on the buccal mucosa (Fig. 12).

2. Syphilis. This disease produces many types of lesions in the mouth. Parenthetically speaking, in no mucous membrane lesion should the case be dismissed without the consideration of the possibility of syphilis, so notorious is this disease in affecting the oral mucosa. Among the secondary syphilitic lesions, the so-called mucous patches may be mistaken for leukoplakia. Their depressed character, very fine covering membrane, slightly inflammatory surrounding areola, rapid onset, usually moist character, occurrence in the commissure as a split-pea sized lesion with a superimposed moist grayish white necrotic covering (Fig. 13) and the usually concomitant generalized skin eruption, with an angina and gene-

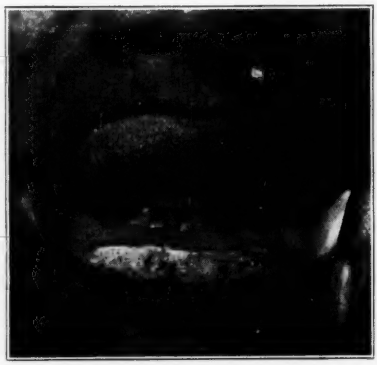

Fig. 19.—Cheilitis exfoliativa.

ralized enlargement of the lymphatic glands, will establish the diagnosis.

It is among the tertiary lesions of syphilis that more difficulty arises in the differential diagnosis between syphilis and leukoplakia. Especially is this noted in the sclerosing glossitis of the tongue, of which we are submitting a clinical example (Fig. 14). Here, it will be noted that the white depressed color is due to scar formation, with the resultant fibrous replacement which has caused the which the mucous membrane has disapproduction of these minute bands from

peared. In general, the absence of scars and of sclerotic and of infiltrating areas differentiate leukoplakia from tertiary syphilis.

3. Lichenification of the mucosa. In this condition, in which there is but an exaggeration of the normal lines of the oral mucosa, is also need for differentiation.

4. Exfoliative glossitis (geographic tongue) with desquamating areas of the tongue. This resembles leukoplakia at times, but there is a great rapidity in progress of the disease, which is vastly different from the chronic course of leukoplakia.

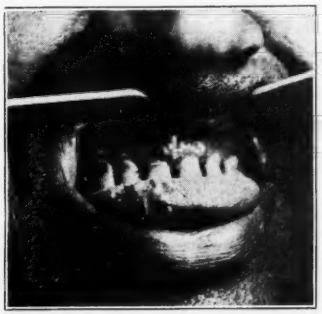

Fig. 20.—Leukoplakia of tongue in syphilis, a possible precursor of carcinoma.

5. Fordyce's disease (Fig. 15). Although this condition has more points of dissimilarity than any of the rest, it must be considered on account of its frequency, which has been placed as high as 75 per cent. Fordyce's disease is a developmental defect of the sebaceous glands of the oral mucosa. This developmental deficiency is demonstrated by the absence of patency of the evacuating duct, as the result of which the degeneration products of the epithelial cells continue to remain *in situ,* where they can be recognized as yellowish white nodules shining through the overlying mucous membrane. Their demonstrability is enhanced if the mucous membrane is stretched. On palpation, instead of being rough, we find them smooth, rounded or oval bodies. Although not symmetrical in distribution, they are, as a general rule, bilateral and the areas of predilection are on the upper lip and in the interdental area of the buccal mucosa.

To recapitulate, may we state that their yellowish color and the smoothness of the covering mucous membrane are at once the important differential and the pathognomonic signs of Fordyce's disease.

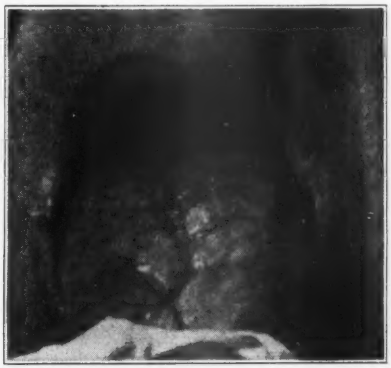

Fig. 21.—Leukoplakia superimposed on glossitis. There is one carcinomatous nodule present.

6. Acute ulcerative conditions, such as Vincent's infection, aphthous stomatitis and thrush. They also present lesions of grayish white. The hyperesthesia associated with them, the pain which they usually produce, their definitely destructive character (except that of thrush) (Fig. 16), the rapidity of their onset, the short time consumed in the complete evolution and healing of individual lesions and the ease with which the grayish white necrotic membrane can be removed are all points which will eliminate

the condition of leukoplakia in a diagnosis.

7. Lupus erythematosus. This is a systemic disease which usually manifests itself on the skin on the exposed surfaces, where reddened patches covered with a fine but tenacious scale are found, which also forms visible plugs in the pores of the skin. The superficial blood vessels are dilated with the formation of new superficial vessels. Further progressive inflammatory change leads to atrophy. At times, the mucous membrane is involved concurrently with the skin, and, at times, the mucous membrane manifestations are the only ones which can be seen.

Fig. 22.—Carcinoma of tongue developing from area of leukoplakia.

We are presenting two clinical figures showing the lesion of lupus erythematosus in two locations, one on the lower lip (Fig. 17) and the other affecting the dorsum of the tongue (Fig. 18). On the lip, we observe it as a hyperkeratotic or a thickened plaque which is made up of pinpoint lesions. The color is bluish white, an important detail in differentiating it from the white, grayish white or milky white of leukoplakia. The lesion here is made up of pinpoint individual spots which have become confluent, but individual lesions can be discerned and we find that they form lines. These lines do not cross and recross as they do in lichen planus, and therefore are of importance differentially. On the tongue, the lesion appears as a bilateral plaque. They are not symmetrical, for the two lesions are of different size and are separated by the median line on the dorsum of the tongue. These lesions were also made up of a conglomeration of minute bluish white dots and lines. Considerable destruction was associated with the lesion, and the lingual mucosa was replaced by the formation of fibrous tissue with the resultant depressed, white and somewhat leathery appearance.

Further, we would like to call attention to the fact that, in both of these patients, the presence of a leukopenia (low white-cell count) aided us greatly in establishing the diagnosis of lupus erythematosus. Another point of importance was the hypersensitivity of the affected oral mucosa in contradistinction to that in leukoplakia.

8. Cheilitis exfoliativa (Fig. 19). This is an inflammation associated with exfoliation, usually confined to the lower lip. The encrustation can be removed with little difficulty except where it fades into the normal lip tissue. The presence of marked inflammatory changes and the formation of crusts differentiate it from leukoplakia.

WHAT IS THE IMPORTANCE OF LEUKOPLAKIA?

Leukoplakia is important, first, from the standpoint of differentiation from other diseases of the oral mucosa. Secondly, it is important because, once its presence is known to the patient, it becomes a source of worry. This is particularly true since wide publicity has been given to chronic mouth lesions as precursers of cancer (Fig. 20). Thirdly,

it is this very chronic and tenacious character which makes it important to both patient and physician. Its real importance is based on the fact that, in some cases, by no means all and very likely only a limited number, leukoplakia develops into carcinoma. (Figs. 21 and 22.)

Moorehead and Dewey[25] quote Leloir, who, in studying carcinoma developing from leukoplakia, found that the changes started from ulceration and not from the intact hyperkeratotic parts; in other words, that the development of carcinoma from leukoplakia was accidental. Moorehead and Dewey themselves believe that a leukoplakia patch which takes on a rough or leather-like appearance should be regarded as potential cancer. Blair and Ivy[26] state that the most common of precancerous lesions is leukoplakia. They state that if leukoplakia progresses after all irritation has been removed and the area becomes fissured or painful, the affected tissue should be excised with a goodly margin of healthy tissue on account of the tendency to carcinoma formation. Kummell[16] also recognized the danger of carcinomatous degeneration. Sutton states that "ultimately, leukoplakia may become cancerous—the ensuing cancer is usually of the prickle cell type." Fox agrees with Bloodgood, whom he quotes: "The moment that a patch of leukoplakia splits, scales or desquamates and leaves an ulcer, the area should be excised with cautery on account of its cancerous potentiality."

So, briefly, that is our great concern with leukoplakia, its tendency toward the development of carcinoma in some instances. Especially is this true of the lesions occurring on the tongue in syphilitic persons with oral sepsis and in the presence of irritation from tobacco.

25. Moorehead, F. B., and Dewey, Kaethe W.: Pathology of Mouth, Philadelphia: W. B. Saunders Co., 1925, pp. 188-191.

26. Blair, V. P., & Ivy, R. H.: Essentials of Oral Surgery, St. Louis: C. V. Mosby Co., 1925, pp. 290-291.

TREATMENT

A review of the literature impresses one with the difficulty which is encountered in the eradication of this process once it has become firmly established. An excellent recapitulation is given by MacKee[27] in his textbook on roentgen-ray and radium therapy. We do not think it necessary to restate the various views, procedures and methods; instead of which, a plain statement of our own opinion will be given.

A complete examination of the patient, including serologic examination for syphilis, is carried out. The next procedure depends on the results of the findings in the general and in the special investigations made. If the patient is found to be syphilitic, treatment begins with the intramuscular injection of bismuth salicylate in 1 to 1.5 gm. doses once every five days. The gingival margin is reexamined carefully and frequently for metallic lines in order to avoid complication by a metallic stomatitis. (Arsphenamin is not given because we think that the stimulation of this drug on epithelization does not have a beneficial effect and may initiate carcinomatous degeneration, or, if the latter is present, further its progress.) Any other systemic derangement is given appropriate attention.

Tobacco is entirely eliminated. We do not agree with the opinion of Kummell,[16] who permits smoking through long holders. As a substitute for tobacco, the patients are asked to chew lico-

27. McKee, G. M.: X-Rays and Radium in Treatment of Diseases of Skin, Philadelphia: Lea & Febiger, 1927, pp. 624-625.

rice. Abstinence from alcohol and highly seasoned and hot foods is recommended.

The local condition of the mouth receives the most meticulous attention. After a careful survey (which includes inspection, transillumination, vitality testing, roentgen-ray examination and a quantitative smear study), the local defects are corrected:

1. A prophylactic treatment using the gingival therapy described by Vastine[28] is given.
2. Sharply abraded and ragged tooth surfaces are rounded off with mounted stones and sandpaper disks.
3. All devitalized teeth are extracted. Wholesale extraction is never done, three teeth at a sitting being the limit.
4. Fillings in vital teeth are polished.
5. Gold crowns and bridges are removed if they cause any gingival irritation, and the teeth thus exposed are polished to render them smooth.
6. If the presence of electrical burns is suspected, all metal fillings are removed and are replaced with zinc oxid and eugenol cement.
7. As a rule, the wearing of dentures is not permitted.
8. Careful instructions are given for home treatment to maintain oral hygiene.
9. A mouth wash containing milk of magnesia is prescribed, to be used after each meal and on retiring.

If, fourteen days after the completion of all these procedures, there is no visible effect on the lesion, and if the lesion is rough or fissured or ulcerated, an attempt is made at its removal. Under local anesthesia with procain and with the use of an electrodessicating current conducted with a long needle, the lesion is destroyed, including a goodly margin of the surrounding healthy mucous membrane. If the lesion is very extensive, only part of it is destroyed at one sitting.

Our experience coincides with that of other observers, in that far advanced lesions of leukoplakia are extremely resistant to treatment, and, in spite of extensive destruction, some recur. We find that, in leukoplakia, just as in many other pathologic conditions, the earlier the treatment can be instituted and the more radical it can be made, the better the results.

Leukoplakia of the oral mucosa is another of the many conditions in which the combined efforts of the physician, pathologist and dentist, and the intelligent cooperation of the patient, are essential.

28. Vastine, A. B.: Research in Subgingival Therapy, J.A.D.A., 17:507-511 (March) 1930.

STAINING OF PORCELAIN JACKET CROWNS AND FACINGS FOR BRIDGEWORK*

By H. M. UEBELE, D.D.S., Milwaukee, Wis.

THE art of staining and coloring porcelain crowns and facings for bridgework is not a new development in dentistry. Its application to dental art has been limited to a comparatively few men who appreciate the value of esthetics in the practice of their profession.

The modern stage of development of this art offers important new possibilities for higher esthetic conceptions for the general practicing dentist. With the advancement in education of the public has come a demand for a more adequate health service. The public expects more of our profession now than ever before. Patients of average intelligence appreciate the value of artistic restorations.

The practice of this art requires no special native skill nor artistic sense. The dentist who is interested in ceramic art, and who possesses the average artistic ability, can acquire proficiency by diligent study and practice.

Following are the reasons that more dentists do not interest themselves in the art of staining and coloring teeth:

1. They feel that they are not artistically inclined and are therefore incompetent to produce good results. 2. They fail to understand that, with a little effort on their part to understand some of its underlying principles, they would be able to do this work surprisingly well.

This type of work is indicated where there is a discoloration of the teeth adjacent to the artificial substitute. Discoloration is brought about by several conditions; namely, the presence of fillings; pulp removal, and mechanical action by which the tooth surfaces have been abraded to the extent of undergoing color variations. As it is impossible for the manufacturer to produce this large variety of shades, it is necessary to resort to the mineral stains to produce color harmony in the artificial substitute.

Frequently, when a bridge or crown is completed and placed in the mouth, there is a lack of tooth harmony. This can be corrected by grinding the facing to proper anatomic form and then staining and reglazing it before cementing the facing or crown to place.

In the use of stains for jacket crowns, it is best to employ a stain which has about the same fusing point as that of porcelain. After the crown is fused, a low fusing stain must be used in order not to disturb the color or cause an overfusing of the porcelain to which it is applied.

In the process of baking, the first application of porcelain is made and brought to 100 degrees from the fusing point. On the second application, the crown is built up to its original size,

*Read before the Section on Partial Dentures; Crown and Bridge at the Midwinter Clinic of the Chicago Dental Society, Jan. 19, 1932.

and then, on the labial surface where the stain is to be applied with a lancet, a thin layer of the porcelain is removed. If a hairline check is to be reproduced, a fine line is made in the porcelain where the check is to be placed. The crown is then placed in the furnace and run up to within 100 degrees of its fusing point. Where the check line was made, there will be a small crevice in the porcelain when cool. A brown or a dark stain is then selected and, with a vibrating motion, this crevice is filled with stain. The stain is chosen for the labial surface and, with the brush, a thin coating of the stain is applied over the area where the porcelain was removed. A coat of a bluish white or opaque white porcelain is then applied over the stain and the crown is returned to the furnace and the porcelain fused. On cooling, the stain will be found fused into the porcelain and the thin covering of porcelain gives it the appearance of depth.

The stain as furnished by the manufacturing concerns comes in sets of eight or ten colors; namely, gray, blue, white, yellow, brown, green, black and pink. With these shades, almost any variation of color and shade can be produced. These stains have fusing points of 1,600-2,400 F.; but, for facings, one that fuses around 1,900-2,000 F. is most practical. The stain fusing at 1,900 degrees can be used in most of the glazing furnaces now in use.

As in all porcelain work, clean slabs and instruments are essential to produce uniform results. Water or glycerin may be used to mix the stain. A 50 per cent solution of water and glycerin has been found useful in my practice as it affords a nice medium and is easily applied.

PREPARING FACINGS OR CROWNS

For preparing facings or crowns, a carborundum stone that is true and not too coarse is selected. A coarse or untrue stone has a tendency to check the porcelain. The glaze is removed from the labial surface, and the facing or crown ground to the proper anatomic form. Reproducing correct anatomic form is essential to establish that harmony which we are striving for. Then, with a sandpaper disk or rubber abrasive wheel, the surface is polished and, with a blast of air, all loose particles are blown away and the surface is washed clean with a brush. The surface is dried with air or a clean napkin and examined for specks or débris. If a speck from the carborundum wheel is left in the crevices, it will show up as a black speck after fusing. The facing is now placed in a holder to avoid contact with the fingers on the ground surface.

With a napkin and dry superglaze or opaque white powder, the surface is rubbed dry and the excess removed. This fills the minute pores in the porcelain. The stain for the gingival half is then selected and thoroughly mixed and spatulated with the glycerin and water solution to a thin creamy smooth mass. For the lighter shades, I use brown and white, varying the brown to match the adjoining tooth. If yellow is prominent, I use the yellow and brown stains, varying the combination to fit the case. Superglaze or opaque white, mixed with the stain, helps modify its color. A small brush, about a No. 5, is then filled with the mix, and the stain brushed on from the gingival margin. The stain should be thickest at the gingival margin, and gradually tapered toward the center of the crown or facing. A small amount of the glycerin and water is placed on the

end of the slab and the brush rotated in it to remove the stain. With the moist brush and the painting motion, any excess stain is removed.

The stain for the incisal half of the tooth is then selected. For gray tips, gray stain with black is used, and, for blue tips, blue with black; about 1 part black to 7 or 8 parts of gray or blue. This is spatulated well with the medium and applied with the painting motion, starting at the incisal edge and working toward the gingival, slightly overlapping the gingival stain at the middle. The excess stain is then removed from the brush and, with the moist brush, the excess stain is removed from the facing. A slab covered with silex is employed, the facing being placed on it, with the stained surface up, and set before the furnace door to dry. All moisture must be removed before placing it in the furnace, and then the temperature is raised to the fusing point of the stain used. The case is then cooled slowly and examined as to color. If the color is intensified, that is, either too gray or too blue, a sandpaper disk is used to remove part of the stain until the correct shade is obtained. The facing is put back in the holder and a thin mix made either of superglaze or an opaque white stain, a thin even coating being applied over the entire facing. The case is again dried and put back in the furnace, and the temperature raised to the fusing point of the glaze used. This final application assures that appearance of penetration which is so often found in the natural discolored teeth.

Care must be taken in the cooling process to prevent checking of the facing, especially if it has pins. The current should be switched off and the furnace allowed to cool for several minutes, then the slab removed and placed under a glass tumbler or some similar receptacle to prevent a draught. (This insures even cooling.)

In staining, vulcanite teeth having soldered pins should be invested in a soldering investment before fusing. Very often, when the teeth are abraded or worn down to the dentin, there are fine hairlike checks in the enamel. To imitate these lines, the proper color is selected and mixed with glycerin. Pure glycerin is used to obtain a thick mix. Then, with a small brush, I model into a tapering line. Most checks begin at the incisal and run toward the gingival aspect. For the brown check, I use brown and yellow and for the translucent check, white stain with black or blue. This is now placed on a slab and thoroughly dried before being placed in the furnace for fusing.

On the lower anterior teeth, when the surface is abraded and there is a decided dentin discoloration at the incisal edge, a stain of brown and yellow mixed is used. With a fine stone, a groove is cut mesiodistally in the artificial tooth and filled with this stain, then fused. For grooves or sulci in posterior teeth, a dark brown or slightly black is usually required. In such cases, when decalcified spots are to be produced, I use a white stain with a touch of tin oxid. If depth is required, I roughen the surface that is to be stained, with a small stone; then apply the stain in the spot that has been ground and add an overglaze, such as opaque white or superglaze; dry slowly and place in the furnace and bring the temperature to the fusing point of the stain.

When a large amount of the process has been destroyed and the pontic has been brought down to fill this space, in length these facings are out of proportion to the adjoining teeth; which

results in a lack of harmony. This condition can be remedied by applying pink stain mixed with yellow porcelain to the gingival third of the facing, the porcelain being applied in such a way as to imitate the gum on the adjoining teeth.

BAKING PORCELAIN SADDLES ON FACINGS

The baking of porcelain saddles on facings in pontic work has been one of the greatest factors in maintaining a healthy condition of the gum, and, if properly made, this saddle is the easiest of all fixed bridges to keep clean.

When the first pontics were made, the greatest mistake lay in trying to have the pontic extend into the gum tissue. This caused considerable inflammation, but today most authorities agree that a saddle which comes just to the gum tissue, and is properly glazed, is as nearly the ideal as can be hoped for in a fixed bridge.

The saddle should be made small and enough space should be left between the teeth to insure that it can be easily kept clean with a toothbrush.

A facing, selected to fit the case, is ground to proper occlusion, the necessary space being left at the gingival aspect (at least 1 mm.), between the facing and the model. The facing is roughened on the inside where the porcelain saddle is to be applied. The backing is now placed in the holder and the porcelain applied in the usual manner. It is then carved to the size desired, and contoured to fit the ridge. The facing is then placed on a slab and allowed to dry before placing in the furnace. Porcelain fusing at 2,200 or 2,300 degrees is used for this work, the temperature of the furnace being brought to within 100 degrees of its fusing point on the bake, and cooled slowly. It is now possible to fit the facing on the model, the saddle just applied being ground to fit the ridge. Then, with a disk, the porcelain is polished, especially the part over the ridge. This is now placed in the furnace and brought to the fusing point of the porcelain. Care must be taken not to overfuse, as an overfused surface becomes porous.

If one of the newer backings is used, on one which the saddle is already baked on, the proper facing is selected and the saddle ground to fit the ridge. Then, with a disk, the porcelain surface is polished and a thin coat of low fusing porcelain or superglaze applied. This is then placed on a slab, dried, placed in the furnace, and the temperature brought to 1,700 degrees. On cooling, the saddle part is again disked and another thin layer of the glaze applied, the furnace temperature being brought up to 1,800 degrees. This should give a nice, even glaze. Dental tissues will tolerate a properly glazed saddle better then any other foreign material thus far in use.

If a bridge is made before the process has healed, the usual method is followed, the pontic saddle being ground to approximately the proper length. The bridge is cemented to place, but the facings are set with guttapercha. After the process is healed, the facings are removed by warming and the saddle ground to the ridge and glazed or, if it is too short, with a low fusing porcelain, the required amount is added and cemented to place. This insures correct fitting saddles, of the pontics to the ridge where the bridge must be placed immediately after extraction.

PARTIAL PULPECTOMY: A RATIONAL TREATMENT FOR EXPOSED PULPS OF TEETH WITH INCOMPLETELY CALCIFIED ROOT ENDS*

By MYRON S. AISENBERG, D.D.S., Baltimore, Md.

YOUNG patients occasionally come in with exposed pulps of teeth having incompletely calcified root ends, with a request from the departments of operative dentistry and orthodontia that, if possible, these teeth be retained in a useful capacity.

We have been fortunate, in obtaining material for study, to observe the connective tissue reactions about root ends that have been injured in various manners; and we have asked ourselves this question: Do reparative changes occur, and, if so, of what nature, and are they desirable reactions?

The following cases, untreated by dentists, serve to show that a protective reaction takes place that is highly desirable.

Fig. 1.—*A*, carious lesion; *C*, islands of secondary cementum; *P*, necrotic pulp.

Fig. 2.—*C*, islands of secondary cementum; *P*, necrotic pulp.

In Figures 1 and 2, we see a lower bicuspid from a boy, aged 10, in which caries developed before the root end was completely calcified. At *A*, we see the carious lesion; *P*, the necrotic pulp, and *C*, several islands of secondary cementum developing in a hurried attempt to close the foramen. This reaction corresponds

*From the Department of Dental Pathology, Baltimore College of Dental Surgery, Dental School of the University of Maryland.

to the "walling off" of an abscessed area with connective tissue.

Figure 3 shows an upper central incisor from a girl 14 years old. This tooth was injured in a fall seven years ago.

Fig. 3.—Upper central incisor injured in fall seven years previously.

Fig. 4.—*P*, necrotic pulp; *C*, outgrowth of secondary cementum.

Figure 4 is a low-power magnification of the root end. At *P*, we see the necrotic pulp, and at *C*, we observe an outgrowth of secondary cementum in an endeavor to close the foramen.

Figure 5 is another section deeper in the series. At *P*, we see the necrotic pulp,

Fig. 5.—*P*, necrotic pulp; *C*, secondary cementum lining wall of root canal; *B*, outgrowth of secondary cementum.

Fig. 6.—Lower lateral incisor injured three years previously.

and at *C*, we observe secondary cementum, torn during sectioning and lining the wall of the root canal. This secondary

cementum is continuous with the outgrowth *B*, also of secondary cementum, which endeavored to close the foramen.

Undoubtedly, after this reparative process had taken place to a degree, infection resulted from the presence of organisms transmitted through the blood stream.

Figure 6 shows a lower lateral incisor from a boy, aged 18, which was injured three years ago.

Figure 7 is a low-power magnification of the root end. At *P*, we see the pulp tissue, which has been converted into adult connective tissue. There are no inflammatory cells present in this tissue. At *C* are several areas of resorption and subsequent repair with secondary cementum, with a reattachment of the pericemental fibers following a tear when this tooth was injured. At *NC*, we observe secondary cementum that lines the wall of the root canal for its entire length.

Here, we see a type of repair in which we have a tooth without a pulp. The dentin is entirely "encapsulated" with cementum, and, in place of a pulp, we have a new pericemental membrane.

In Figure 8, a section from the side of the root, *D* is the dentin in which there is a resorption space from where the pericemental fibers were torn when the tooth was injured. It is now repaired (functional repair) with secondary cementum,

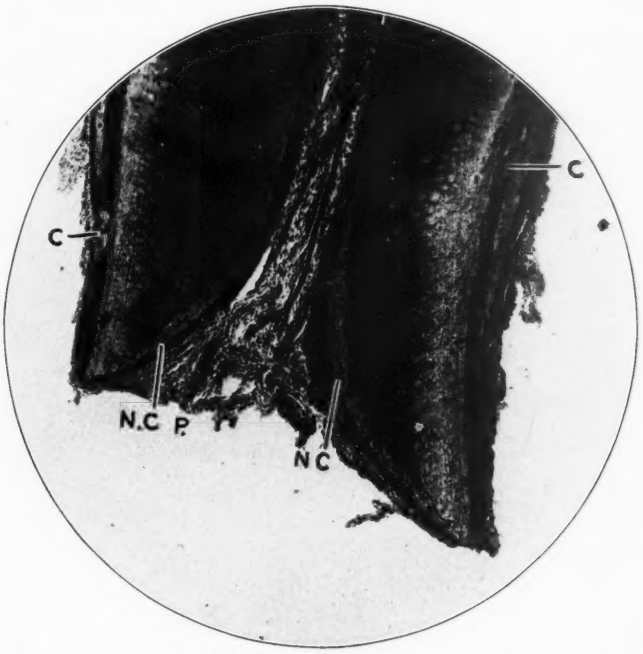

Fig. 7.—*C*, areas of resorption in old cementum with subsequent repair. *NC*, secondary cementum lining walls of root canal; *P*, pulp tissue that has been converted into adult connective tissue.

C. A new pericemental membrane (*P*) is shown whose fibers are attached to the new alveolar bone *B*. *OC* is the old cementum on the surface of the root.

Figure 9 shows an upper central incisor from a boy, aged 9 years. This pulp was exposed after a fracture. An attempt was made to cap it. This roentgenogram was taken one year later.

In Figure 10, a low-power magnification of the root end, *P* is the necrotic pulp. At *C*, we observe secondary cementum, directly continuous with that from the outside cementum, lining the pulp chamber for a distance of 3 mm. At *B*, we see adult connective tissue, similar in structure to a pericemental membrane.

Figure 11 is a high-power magnification of one side of the root end. At *D*, we see dentin; at *C*, the old cementum (thickened), and at *NC*, the new secondary cementum lining the root canal. At *A*, this cementum is developing toward the other side in an endeavor to close the apical foramen. At *P*, we see the necrotic pulp. At *PM'*, we see the pericemental membrane, and at *PM*, a similar structure (adult connective tissue) in the root canal.

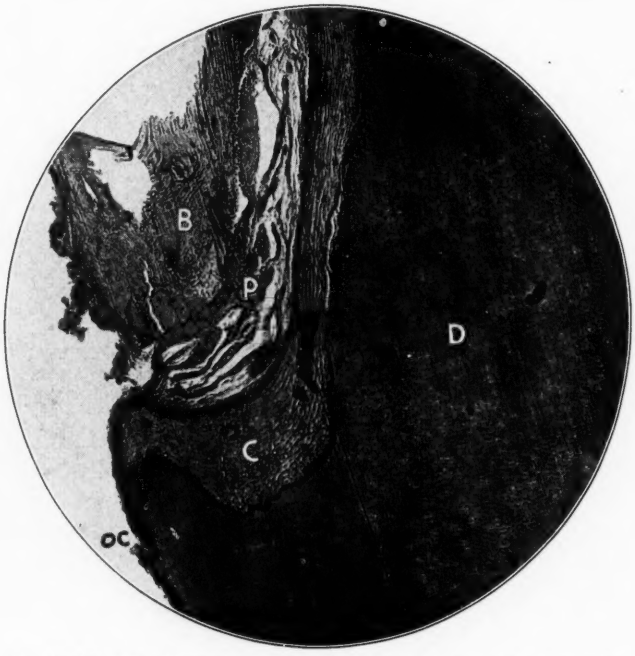

Fig. 8.—*D*, dentin; *OC*, old cementum of root surface; *C*, secondary cementum; *P*, pericementum; *B*, alveolar bone.

Figure 12 is a section from the side of the root showing a resorption space in the dentin (*D*), filling in with secondary cementum (*SC*) and a reattachment of the pericemental fibers *(P)*. This repair is similar to that in Figure 8.

Fig. 9.—Upper central incisor fractured one year previously.

are torn (functional repair) and reattaches them.

4. The embryonic pulp tissue is quickly converted to adult connective tissue. This tissue is incapable of building new dentin; hence, the calcified tissue must be cementum. This cementum in the greater majority of instances is secondary in character.

5. In the case of Figures 9, 10 and 11, infection followed capping of the pulp. We believe that if the coronal portion of the pulp was cut off (removing the supposedly infected area in toto), that repair would have followed, similar to that in Figure 7.

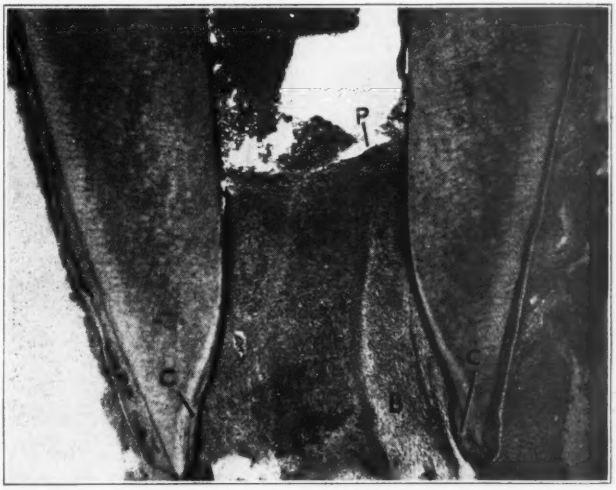

Fig. 10.—*P*, necrotic pulp; *C*, secondary cementum lining wall of root canal; *B*, pulp tissue which has been converted into adult connective tissue.

From the photomicrographs shown, we conclude that:

1. Repair by secondary cementum is the natural sequence in both untreated and treated cases.

2. The secondary cementum makes an attempt to hurriedly close the apical foramen.

3. The secondary cementum repairs areas from which the pericemental fibers

A case presented itself one-half hour after the pulp was exposed. Infiltration anesthesia was given, and a rubber dam applied. The tooth surface was sterilized with 3 per cent iodin followed with 95 per cent alcohol. The pulp was completely exposed with a No. 6 round head bur,

and its coronal portion removed. A slight hemorrhage resulted. This was checked by careful application of a sterile cotton pellet. A paste of zinc oxid and eugenol was made and very lightly packed over the stump. The remainder of the cavity was sealed with cement.

Figure 13 shows two roentgenograms, the one on the left being taken before the operation and the one on the right, fifteen months later. Complete closure of the apex is noted. We believe that, in this case, the pulp changed to adult connective tissue, and the walls of the pulp chamber are now lined with secondary cementum.

Fig. 11.—*D*, dentin; *P*, necrotic pulp; *C*, old cementum thickened; *NC*, secondary cementum lining wall of root canal; *A*, outgrowth of secondary cementum; *PM*, pulp tissue which has been converted into adult connective tissue; *PM'*, pericemental membrane.

Treatment of other cases is now under way, and, at the proper time, our results will be published.

Fig. 12.—*D*, dentin; *SC*, secondary cementum; *P*, new pericemental fibers.

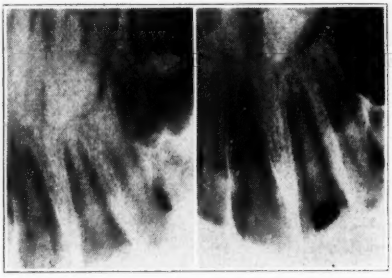

Fig. 13.—Left: Upper central incisor with incompletely calcified root end and exposed pulp following fracture. Right: Tooth shown at left, fifteen months after treatment.

HEALTH INSURANCE, CLINICS, CORPORATE OR CONTRACT PRACTICE AND RESULTING ORGANIZATION PROBLEMS*

By HERBERT E. PHILLIPS, D.D.S., Chicago, Ill.

ONE year ago, at Memphis, the Board of Trustees and the House of Delegates, at the request of the President, refused a vote of confidence in the committee of which I am chairman. This fact makes pertinent a short introductory statement relating to the appointment and function of the Committee on the Study of Dental Practice.

In the summer of 1929, Dr. Ray Lyman Wilbur, Secretary of the Interior, wrote our Trustees requesting that studies relating to some of the economic phases of dental practice be undertaken by the American Dental Association. These studies were for the purpose of securing information that would assist the Committee on the Costs of Medical Care, of which Dr. Wilbur is chairman, in making recommendations for the extension of dental care to the American public.

Inquiry was made of certain of the medical profession who were already members of Dr. Wilbur's committee as to the advisability of the American Dental Association's giving the requested cooperation. Dr. Harris, then president of the American Medical Association, strongly recommended to our Trustees that the American Dental Association join with the others and cooperate with the Committee on the Costs of Medical Care. Drs. C. E. Rudolph, R. E. Denney, H. J. Leonard, Guy S. Millberry and I were appointed by the Trustees to work with the Committee on the Costs of Medical Care and have been known as the Committee on the Study of Dental Practice. Two members of this committee, the chairman and Dr. Rudolph, were later appointed by Dr. Wilbur to serve on the Committee on the Costs of Medical Care. In carrying out the instructions of the Board of Trustees, this committee has published six reports. These reports have been accepted as scientific unbiased studies and the publication of five of them by the University of Chicago Press gives them place in scientific circles. They form one of the most authentic, most comprehensive series of economic studies relating to its practice ever made by a professional organization.

The reports are as follows: 1. "The Way of Health Insurance," by A. M. Simons and Nathan Sinai. 2. "The Cost of Equipping a Dental Office," by Dorothy Fahs Beck. 3. "Income and Practice of Dentists in Twenty States," by Maurice Leven and Dorothy Fahs Beck. 4. "Dental Clinics in the United States 1930," by Miriam Simons Leuck. 5. "A Further Study of Dental Clinics,"

*Read at the First General Meeting of the Seventy-Fourth Annual Session of the American Dental Association, Buffalo, N. Y., Sept. 13, 1932.

by Miriam Simons Leuck. 6. "The Cost of Dental Education," by Miriam Simons Leuck. "A Summary of Facts Pertaining to Dentistry as Presented by the Committee on the Costs of Medical Care," by Dorothy Fahs Beck, was also published.

Numerous reviews and comments have appeared in dental and medical magazines relative to the studies. Among others, the *Dental Digest* and the *Dental Cosmos* have given editorial space. An excellent graphic presentation of the facts of each study was given in several issues of the *Dental Survey*. Especially notable is the editorial comment in the *London Lancet,* June 4, 1932, on "The Way of Health Insurance." I quote:

> In 1930 the American Dental Association decided to make, with the assistance of the American College of Dentists, an investigation into the operation of health insurance in Europe. . . . The Association was fortunate in securing the services of two highly competent investigators, Mr. A. M. Simons and Dr. Nathan Sinai. . . . The result of the investigation is a masterly document—informative, critical, and very readable—which cannot fail to interest not only medical and dental practitioners, but also all persons who care for public health progress. Though the report is informative to a high degree its main concern is not to describe insurance institutions and regulations, but to focus attention upon the way in which insurance operates and the effects of that operation upon the human beings involved.

The *London Lancet* is perhaps more widely read internationally than any other medical publication.

The American Medical Association journal has presented several reviews but there has as yet been no editorial comment by the American Dental Association journal.

I have given this historic sketch so that the facts relating to the appointment and work of this committee may be part of our records. I hope that I have also made clear in your minds the difference between the Committee on the Costs of Medical Care and the Committee on the Study of Dental Practice.

Can the mass of the people afford medical or dental care? Is modern medical or dental science available to the great majority of the people?

The Committee on the Costs of Medical Care was created May 17, 1927, to conduct a study of the problems involved in the foregoing questions, to collect all the facts available and to present to the American public and to those professionally engaged in the various branches of medical practice practical plans for securing adequate medical service for the people at costs reasonably proportionate to their individual and collective means. A five year program was outlined with this aim in view. This committee is not an official committee of the national government. It is a voluntary organization. The expenses have been contributed by the leading funds of the country. The five years will be up this November and the Committee findings will be published at that time.

Meetings convene twice a year in Washington, D. C., and a large proportion of the members attend. An executive committee of seven members meets monthly. Nine outstanding individuals in the employ of the committee make up the staff who have conducted the research studies. Physicians, dentists, nurses, public health officials, insurance officials, business men, club women, sociologists, economists and statesmen make up the committee membership. Dr. Ray Lyman Wilbur, as before stated, is chairman.

In presenting this paper, I am not presenting the views of the Committee on the Study of Dental Practice. The func-

tion of that committee was, as pointed out, to make studies to secure factual information for the use of the Committee on the Costs of Medical Care and to cooperate with that body. The facts as collected are in printed form and are available to all members of the American Dental Association. Therefore, in presenting this paper, I am speaking as an individual member who has been exposed to a collection of related facts and am attempting to present and analyze a few of the most pertinent of them.

Facts relating to the beginnings of voluntary health insurance, the evils and abuses that developed, the evolution of compulsory health insurance, the early transference of the evils and abuses of voluntary into the compulsory scheme, methods used in modifying and in some systems eliminating many of the evils and abuses, will be discussed. Because these facts are written in the fifty years, experience of our professional brothers in Europe, we will take a few pages from their history as a basis for our presentation.

In the United States, we will look at the beginnings of voluntary insurance; we will draw some facts from types of compulsory systems. Consideration will be given to the pattern of voluntary insurance schemes that may be transferred, evils and all, into an American compulsory health insurance scheme. Organization problems flowing from this presentation will be discussed.

Voluntary health insurance is, as the name implies, a voluntary contract between a carrier and the assured. It had its beginning a century ago as one of the benefits given by the racial, trade, religious or fraternal societies so prevalent in Europe at that time. A benefit of medical care was provided by a lodge doctor who contracted to care for all the members at a fixed fee or annual rate. These fraternal societies with their medical care contracts made with individual physicians were the soil in which grew many sad perversions of medical practice. Keen competition between physicians for contracts, low fees for medical service, poor service, lack of free choice of physicians, malingering, all had their beginnings in voluntary organizations. Lodge practice gave the contract physicians some degree of economic security, but it shattered the ideals of service that had been professional traditions for generations. The contemporary private practitioner of the early days looked on lodge practice not only as the destroyer of professional ideals but also as the source of discord and division then existing within the ranks of medicine.

Lodges and friendly societies had their roots and origins in a world of small industries and stabilized population groups. With the passing of time and the development of the machine, small industries gave way to ever larger units of production. Populous cities grew up. Mass production with seasonal unemployment forced workmen and their families to move from place to place. Lodge medical service was deteriorating and the low paid population become increasingly dissatisfied. Medical science was advancing. Although the menace of dental disease was little known, there were being developed at this time new methods for the care of the sick, and large industries were realizing that sickness among the workmen was a costly item of overhead. Governments were concerned for the health of the workers because they would make up the bulk of the army in case of war. Trade unions were urging the workers to political action to better their conditions. The ques-

tion asked over and over again was, "What can we do to secure good medical care for our low paid population?"

The professions divided did nothing. Commissions were appointed to study the question of medical care and related subjects. Their reports recommended extensive social insurance programs, including compulsory unemployment insurance, compulsory sickness insurance and old age pensions. This suited the workmen whose lodge membership had made them insurance minded.

Here we have all the ingredients of impending change ready to hand: large groups of low paid dissatisfied workers unable to afford good medical care turning to political action for relief. Industrial leaders and governments were interested. Social workers and lay leaders urged compulsory sickness insurance.

If you were a politician with your ear to the ground and heard the grumble of the worker, the complaints of the industrialist and the recommendations of the welfare workers, economists and commissions, what would you do? If some thousands of professional men objected but offered no alternative, would you pay much attention to them? Neither did Bismarck nor Lloyd George. They had compulsory insurance laws enacted and turned the management over to the fraternal societies that had had experience with voluntary insurance. They also possessed great political power. Their pattern of voluntary insurance became the pattern for the new compulsory systems. Commercial insurance companies immediately entered the field. The professions on the outside organized trade unions to fight the insurance funds. They even went on strike, sacrificing prestige and public esteem. They lost ground until finally they had to acquiesce.

Then began for our European brothers the long uphill climb toward participation in control of the systems in which both physicians and dentists carried on their life's work. Is it not easy to see how under the management of the fraternal societies the evils of voluntary insurance were woven into the warp and woof of the early compulsory systems?

In a sketchy way, we have viewed the evolution of compulsory health insurance. Twenty-eight countries now have compulsory systems and all countries belonging to the League of Nations have pledged themseves to do the same for the low paid population in their several countries.

The evils of the earliest systems of compulsory health insurance in their beginnings were fought at every turn by the professions. In Germany, they have made very little headway and the *Krankenkassen* (fraternal sick benefit societies) still dominate the field of medical and dental care. In England, the professions have fought the same fight but have been much more successful. They have modified some of the worst evils in the systems and are constantly on the alert to improve the service. The British Medical Association has lately presented a plan for the extension of compulsory insurance to cover a major portion of the people. They speak of themselves as medical architects with plans for building medical care for the English nation. Their plans will probably form the pattern for the future improvements of the English system. The English dentists are well organized and present a solid front. They are alert to their interests and are striving enthusiastically for the extension of insurance to cover a larger portion of the population.

As pointed out, Germany and England have the oldest compulsory insurance

systems. In establishing their individual systems, did other countries profit by the sad experiences of Germany and England? What were the attitudes of the professions toward the later systems? Did they stay on the outside? Did they strike after the insurance set-up was complete or did they get in on the ground floor and help mix the concrete before it was poured? Acting on the advice of men like Dr. Cox, secretary of the British Medical Association, many of them have decided to cooperate and direct rather than fight a losing battle against social trends. The result is that, in some of the later systems, the professional groups have made the studies and developed the plans to be presented to the legislative bodies. For example, the Canadian Medical Society, in 1929, appointed a committee to develop plans for compulsory insurance to be presented if and when the legislative bodies of the provinces showed interest in the subject. In other countries, the professions have sat in on the commissions and have worked with other groups in laying the foundations, as in France, where the commissions that rewrote the compulsory health laws included physicians and dentists in their membership.

The permanence and feasibility of compulsory insurance has been accepted by the International Medical Association with headqquarters in Paris. All important medical associations in the world, including the American Medical Association, are members. This body has made an intensive study of professional relations with insurance systems. Help and advice are obtainable, by medical organizations, from their bureau. They are in favor of compulsory insurance under professional control. The International Dental Federation at the recent meeting in Paris, through one of its sections, passed a resolution recommending compulsory insurance as a method of payment for dental care of low paid workers in all countries. In no country have they abandoned compulsory health insurance once it has been started. Where insurance has been introduced, it has tended to expand and include even larger sections of the population.

INSURANCE IN THE UNITED STATES

How do we Americans regard insurance in general? Do we use it to a great extent? Are we insurance minded? Life insurance coverage to the extent of $113,000,000,000 is now in force in the United States. Seventy-five million dollars is expended annually for medical care under the Workmen's Compensation insurance. Accident and health policies paid over $205,000,000 in cash benefit in 1930. Beginning in 1911, group insurance has increased remarkably and, in 1930, it is estimated that $10,000,000,000 represents the coverage in that field. The members of the American Dental Association are insurance minded. They have contributed to the growth of group insurance by participating under the policy negotiated by their insurance committee.

DEFINITION OF CONTRACT PRACTICE

The Judicial Council of the American Medical Association gives the following definition of contract practice: "By the term contract practice as applied to medicine is meant the carrying out of an agreement between a physician or a group of physicians as agents and a corporation, organization, or individual to furnish partial or full medical service to a group or class of individuals for a definite sum or for a fixed rate per capita."

You will note that this definition covers all forms of insurance practice. Contract practice, according to Dr. Leland of the Bureau of Economics of the American Medical Association, had its beginnings in the pioneering industries such as lumbering and mining. These industries were often far from communities where medical service was available. When necessary, this type of practice is considered legitimate and ethical by the American Medical Association Judicial Council. Each individual case of contract practice, however, must be judged by itself on its merits.

Contract practice implies that two parties enter into a contract, one who pays and one who gives service at stipulated fees. To illustrate, we will divide these two parties into lists of those who pay for medical service and those who deliver medical service.

Those who pay for medical service are: industrial groups of employes; trade unions; mutual benefit associations; fraternal organizations; community groups; medical benefit corporations; voluntary groups in connection with compensation; student bodies, and individuals.

Those who deliver medical service are: industrial plant physicians and dentists; dental and medical group clinics; hospital staffs (fixed fee); university group clinics; county medical societies; dental clinics, and individual physicians.

This is not by any means a full list but it will suffice to suggest the scope of voluntary insurance and contract practice in the United States. You will note that in this list much of the contract or insurance medical care is provided not by practitioners in private practice, but by practitioners engaged in group practice. Thus, many groups of consumers of medical care purchase their care from groups of producers.

In connection with contract practice and insurance payment, all the evils of European voluntary service have developed. Experiences in California and Washington are well known examples where insurance companies are dominant and many evils and abuses exist.

In 1927, the Judicial Council of the American Medical Association, after a study of the subject of contract practice, stated: "There is no doubt that the practice is growing in frequence and becoming widespread. In fact, it is entering into so many phases of the practice of medicine as to be a distinct menace to the stability of our organization. In one instance an entire state seems to be divided unto itself on this subject."

This last point raised by the Judicial Council in regard to contract practice being a menace to the stability of the organization is important and deserves most careful consideration. Why is it a menace? We have only to go to Dallas, Texas, to where the battle is raging.

The Dallas Surgical and Medical Clinic made up of a staff of eighteen physicians had a contract with a group of street car employes of Dallas to furnish medical service on a yearly charge per member. The clinic staff was made up of prominent physicians. Two of the staff were charter members of the local county medical society. Two were past presidents and all of them had worked on committees or had been active in other ways in the society. Nevertheless, charges were preferred against them by the board of censors, worded in part as follows: "We hold that a contract which provides for medical and surgical service to be rendered to patients in their homes or in hospitals at so much a head

or so much per month does act in restraint of reasonable competition." The clinic physicians were indefinitely suspended. They have appealed their case. One of the statements in their appeal reads as follows: "Contracts such as ours meet a great social need in that by utilizing the principle of insurance they make available to persons of limited means competent medical service which would not be available to them except through the degrading practice of receiving free private service or attending free clinics." They continue: "Since we have no intention of relinquishing our contracts, if we are found guilty, our right to membership in the Texas State and American Medical Association will terminate. . . . To be consistent the society must immediately expel all other physicians who have contracts." The clinic physicians as a reason for the insurance scheme states, "The wages received by practically all of the members of the (car men's) benefit association are barely adequate to provide them and their families with the necessities of life and leave them no margin for providing needed medical attention. . . . In view of the very meager earning capacity of an overwhelming number of the benefit association members and of the certainty of payment we do not believe that any group of doctors would refuse to take the contract off our hands."

AN ILLUSTRATION

In order to illustrate the effects of commercially directed competition for fees between medical practitioners, let us imagine that an insurance company is planning health insurance in Buffalo. The company already has all the figures on the incidence of disease, all the actuarial data on overhead costs. Medical care is something they must buy in the open market. Let us suppose there are four group medical clinics in Buffalo. In the city also are many private practitioners. The insurance medical contract agent goes to Clinic No. 1 and says, "I will have so many cases of this and so many of the other in the next year. How much will you take care of them for per capita? What scale of fees will you work for?" He repeats this to Clinics Nos. 2, 3 and 4. The private practitioner may also be asked, but the group clinics already organized with lower fixed overhead can generally expand without much added cost and so are in a position to outbid the private practitioner. The contract man takes the lowest bid.

This competition for fees among the clinics lowers the standard of service and results in low pay and overwork of the staff and thus the profession and public both lose. How about the private practitioner? His patients go to the clinic and he begins to see red. He goes to his medical society and asks the committee on ethics to prefer charges against the clinic physicians and demands they be thrown out of the society. A trial is held. Hard words are passed, old time confrères take opposite sides and the clinic physicians are suspended or expelled. They appeal to the higher authorities. The case becomes an issue; the split in the local society becomes wider in the state, and develops into a distinct problem in the national body. Other cases of the same kind from other states are also up for trial. What shall be done? Will the contract physicians have to be put out in increasing numbers to form a rival organization? Or will they attempt to get political control of the local societies? This already has been attempted in some places with a degree of success. In either case, the medical society may be split and internal

warfare lessen its strength and social usefulness. Charges of incompetence and lack of social adaptation are made by lay persons and others against medical and dental organizations. Even if these accusations are true, the fact remains that these professional organizations are important coordinating bodies and the only rallying place, the only central bodies from which to expect the direction and concerted action that is so necessary in setting and enforcing the standards so necessary to public welfare. A house divided against itself cannot stand. The picture I have drawn is not imaginary. Trials and expulsions of this type have already taken place and will increase in number. In some places, rival organizations have started.

Professor Eliot, in the *Chicago Dental Society Bulletin,* points out that the costs of dental operations are easier to work out on an actuarial basis than medical care because there is more uniformity in dental care. Suppose the insurance funds with the foregoing idea in mind had their medical care well established in group clinic practice and with an eye for more business decide to write dental care policies. They go to the group medical clinic now serving them who have a dentist in their employ. (There are about 200 medical group clinics in the United States. In the great majority of cases, when a dentist is on the clinic staff, he is an employe rather than a participating owner of the clinic.) The insurance fund proposes that a few more dental chairs be put in and offers a contract for dental service for several thousand policy holders. The contract may call for complete or limited dental care for a fixed or for an annual fee. A number of dentists are added to the staff. A dozen private practitioners not overly busy decide insurance practice is not so bad, and so rent space, fit up a clinic and underbid the medical clinic. An advertising dental office may do the same thing. It is easy to visualize the results. Commercially directed competition for fees between professional men either dentists or physicians spells disaster to professional traditions and good service. Commercially directed competition for fees is the point where professional attention must be focused. Potentially, it is the bollweevil of good medical or dental service and the cut worm of professional ethics and traditions. For the welfare of the public, we must quarantine against it.

COMPULSORY INSURANCE IN AMERICA

Workmen's compensation insurance is compulsory in forty-four states. As far as its relation to practitioners and patients is concerned, this system takes on many of the features of compulsory health insurance. New York state is a good laboratory in which to observe its development. Here, for many years, has been a battlefield with lines drawn between the New York Medical Society and compensation insurance interests. This battle parallels the most intense conflicts in Europe. Lay control, low fees, fierce competition, lack of free choice, malingering, all have been issues in the fight.

One of the results of competition between practitioners for the medical work of the insurance carriers in this state was the agreement between a number of physicians and insurance carriers to report accident cases as being less severe than they actually were, thus giving the insurance carriers the legal reason for paying the injured workmen less than he should receive. A longshoreman had his back broken, also his collar bone. The insurance physicians reported only the collar bone fracture and the man's compensa-

tion ceased long before he was out of bed. This case was taken up by the longshoreman's union and the appalling situation was disclosed. Competition for fees under either compulsory or voluntary systems has the same devastating results. It is only within the last year that the New York physicians have been successful in establishing amicable relations with their old time foes.

DENTAL CLINICS

The study of dental clinics in the United States[1] indicates that the majority now in existence were started within the past ten years. This fact is significant when we remember that it is in the dental clinic that the intervention of a third party between patient and practitioner is added as an element in rendering dental service.

We received replies from 1,530 dental clinics. School clinics, industrial clinics, health clinics, dental school clinics, all are included. Eighty per cent of those reporting cared for about 2,000,000 people in 1930.

There are about 11 per cent of the practicing dentists in the United States working either full or part time on salary. However, not all are employed in clinics. The median salary for school clinic dentists is $1.61 per hour, industrial clinics, $2.02, health center, $1.67, and hospital clinics, $1.32. Median incomes of dentists in clinics is less than median incomes in private practice.

Religious, political, industrial and fraternal groups, charities and dental societies, all have had a part in starting these clinics. This wide distribution of interest is an index of the concern of lay groups in dental service. When the King's Daughters, the Elks or the Lions start a dental clinic, they have become convinced of the value of dental care and try to supply it free or for low fees. The interest of these lay groups in dental clinics is striking when it is remembered that these same interests in the earlier days were the proponents and builders of hospitals. They with others have to date invested about $3,000,000,000 for hospitals from which they expect no monetary return.

Very hastily, we have glimpsed a few of the insurance, contract and clinic schemes now in operation. We have shown the American people to be insurance minded. What developments may we expect for the future? What do the experts say? We will quote from Mr. Pierce Williams, author of the "Purchase of Medical Care Through Fixed Periodic Payment," who says:

> Whatever the future course of developments with regard to compulsory sickness insurance, the way lies open for interested groups to encourage the adoption of the fixed payment method of purchasing medical care throughout the United States. The group which appears to lend itself most conveniently to the administration of sickness insurance is the group of employees of a particular industrial, financial or mercantile establishment. The local trade union is another group. Other types of organized groups, professional, fraternal, social, existing in urban communities are equally capable of being utilized for the purpose of voluntary medical insurance. . . . The possibility that commercial insurance companies may at some time in the future find themselves in position to offer policies which undertake to provide medical and hospital care 'in kind' should not be ignored. . . . The fact that at the present moment no organized effort in favor of compulsory sickness insurance is under way should not be taken to indicate that this form of social legislation will not be passed. . . . It is perhaps not necessary again to emphasize that the insurance plan of providing medical service fundamentally alters the traditional relation between the physician and the patient. Instead of receiving payment di-

1. Leuck, Miriam Simons: Further Study of Dental Clinics, Chicago: University of Chicago Press, 1932.

rectly from the person to whom the service is rendered the physician is remunerated by the organization to which the fixed periodic payments have been made. This is equally true whether the scheme of insurance be voluntary or compulsory. The physician may be employed by the insurance organization on a salary; he may be retained by it under a contract to render service to members of the insured group at stipulated fees; or he may be under agreement to perform service at a fixed amount per person per month.

Listening to the words of Mr. Williams is interesting, but what of the insurance companies themselves? Are they thinking of participating in future medical care? I quote from a document issued by the Bureau of Casualty and Surety Underwriters, which is the joint organization representing practically all of the insurance companies in the country.

A Committee made up of Medical Directors of the company members of the Bureau has been working on the medical problem during the last year; another committee made up of members of the Metropolitan Claim Association has been working for a still longer time on the medical problem in New York City. The following is an account of some of the conclusions that have come out of the work of these two committees. "There are indications today that important changes are coming in the practice of medicine; and it may well be that in this realignment the medical profession and the insurance companies will be thrown into still closer relationship. It is important and it will be increasingly important that there should be a better understanding between the doctors and the insurance companies.

What the insurance companies plan for the future is a special interest, and it now appears that the next rapid development will be an extension into the field of voluntary health insurance, through group or individual purchase. One straw indicating the current was noted recently in Chicago when an insurance company presented to some of the members of the Chicago Dental Society plans for a limited type of insurance for dental care.

Of far more significance are the plans now under way by an American insurance company affiliated with one of the largest of the British compulsory health carriers. This company has plans for covering a number of states with a policy providing for medical care to be sold to groups or individuals. Their policies are written, their advertising prepared and their agents ready. Tentative contracts have been made with a large number of prominent physicians both in group clinics and in private practice. These physicians have agreed to do the medical work for the insurance companies at a fixed fee, a form of contract practice. Forty-five per cent of all premiums will be taken by the company for overhead and profit, leaving 55 per cent to pay the professions for giving medical care. Dental care will be considered as soon as medical service is well under way.

INSURANCE COMPANY MOTIVE

In a discussion of insurance, it is necessary to have a clear understanding of the attitudes and viewpoints that motivate the insurance carriers as well as an understanding of the attitude and the viewpoint of the professions.

Mr. Albert Whitney, associate general manager of the National Bureau of Casualty and Surety Underwriters, presented a paper before the Casualty Actuarial Society in Boston, May 15, 1931. Mr. Whitney says:

Consider the case of an ordinary life policy for instance. The examination has been made, the risk has been accepted, the premium has been fixed, the only element of uncertainty is how long the assured will live. . . . If he lives out his insurance expectancy the company will break even, if he lives beyond this point the company will make money. If the company by its efforts can make the given assured live longer than

he otherwise would, in general such results are clearly a benefit to the company and the sole question from an economic point of view is whether or not this benefit to the company has been secured at too great a cost to make it profitable. . . . It may easily be that the cost of preventive activities in a given case may exceed the savings that are to be had. . . . Eventually there comes a time through the operation of diminishing returns when further conservational activity will not pay for itself and therefore cannot be undertaken. . . . The safety movement in workmen's compensation field did not develop entirely out of the sheer human necessities of the case. . . . A considerable factor was the economic advantage to the insurance company of preventive activities.

To add a third group motivated by the profit impulse to the field of medical and dental care gives promise of developing a service not "out of the human necessities of the case" but for "the economic advantage of the Insurance Company."

Mr. Whitney continues: "The public is generous in recognizing conservational activities and favoring insurance companies that have taken pains to develop this side of the field. People have a vague sense that such companies are giving better value for the money and are more fully living up to their social responsibility." Profits in conservation and further profits in telling about it.

Because all over the world the development of dental service in its organizational phases has, at a later period in the main, paralleled the medical, we ask the question: What are our medical brothers doing to secure understanding and insight that they may move intelligently in the direction of adjustment to the new conditions we have been discussing?

Two years ago, the American Medical Association started a bureau of economics, and they now have two research workers who, in addition to getting material for state societies, are studying workmen's compensation, contract practice, and other phases of changing medical service. The House of Delegates of the American Medical Association this year passed a resolution instructing the board of trustees to give full support to this bureau of economics in order that it may function to the fullest extent.

Wisconsin, California and Michigan State Medical Societies are making studies. In Michigan, the study is under the direction of Dr. Nathan Sinai, whom many of you know. The Milwaukee County Medical Society is studying and developing a plan to give medical care on an insurance basis to a large part of the population in their territory. Incidentally, 50 per cent of Milwaukee physicians are in contract or panel practice.

How about organized dentistry? In some of our cities, there has been an effort made to approach the subject with study and analysis. In Detroit, Dr. Webster Prince, and in St. Louis, Dr. O. W. Brandhorst, with their associates, have made definite progress in laying a foundation for further study. In Wisconsin, the state secretary and the other officers are studying conditions. In Chicago, under the chairmanship of Dr. Frederick Noyes, a committee is making a study of corporate and contract practice. They have secured the services of a trained sociologist and will bring in a report as soon as definite information is secured.

TRENDS

1. The development first of voluntary and later of compulsory health insurance is in my judgment a definite social trend. Evidence indicates insurance will sooner or later become the method of payment for medical and dental care for all except those in the higher income

brackets and for those who are cared for directly by the state.

2. There is also a trend in the direction of group practice in a variety of clinics, hospitals and other organizations.

If we accept these two statements and if the competition between organized groups and between private practitioners for insurance contracts is likely to cause a split in professional organizations, and to lower income through competition to the point where the quality of service will be jeopardized, then some method must be devised by professional organizations to eliminate competition for patients where the fee is the element of competition.

Can this be done? Those of you who have read the report on "The Way of Health Insurance" will recall that in France, under compulsory insurance, there is a fee schedule worked out by a joint commission representing the professions and the other interested groups. All physicians and dentists accept this schedule as basic.

Voluntary health insurance is not so easily controlled. In fact, as we have shown, all the glaring evils in early compulsory insurance systems had their origin in the voluntary systems that preceded them. This was proved up to the hilt in the old lodge practice. If practitioners in the United States, be they in group clinics, hospital clinics, health centers, industrial plants or private practice, compete under commercial pressure for the business of groups of consumers of medical or dental service, the results will be a sad repetition of history. The only competition that could result in better medical care for the patient is in the field of service. Let success in practice for either group or individual rest, not on low fees, but on quality of service. If we allow voluntary insurance to develop here, with the same type of competition and in the direction it has started, we will lay a foundation for bitter struggles with compulsory schemes when they arrive.

How then can we provide medical and dental service for the mass of the people through a system of insurance that will eliminate competition in fees and maintain a high standard of service in either group of private practice? If we examine the records of historical changes that have taken place in the past we will read that hospitals and medical and dental schools owe their progressive development to professional commissions who studied their needs and established standards of service and equipment. I suggest that the medical and dental professions immediately study and create a similar commission for the development of an insurance scheme under their own auspices. Thus, all district fee schedules could be fixed by a committee of the state society in cooperation with consumer groups. Together, they could determine a monthly or yearly rate at which medical and dental service could be sold to individuals or groups. Practitioners who desired and whose patients were willing could charge in excess of this schedule as is done in the French compulsory system. Such a scheme would eliminate the insurance companies with their overhead and profit and the professions could deal directly with the patients or patient organizations. In fact, one county medical society is at the present time carrying on a similar scheme. It had to do it or let the insurance companies dominate the practice of medicine in its locality. The development of group practice could be standardized under the same auspices.

If, under professional control, mistakes are made, they can be rectified; if

under insurance control, a long and hard struggle generally ensues. Need we point out that if this plan were to be developed and participated in only by members of the organization, nonmembers might have an incentive to sign application blanks.

The American Dental Association is the center from which concerted directive action and leadership must come to meet what Dr. Prince has called "The Maelstrom of Political and Social Change" that threatens to engulf us. Let us examine and analyze the potential adequacy of our present set up and see if we may determine the extent to which it meets our present needs for leadership.

Two years ago, at the A. D. A. Meeting in Denver, a resolution was presented requesting the Trustees to create a bureau of economics in the Central Office to make plans for meeting the new problems of our profession. Dr. Brady, Trustee from Pennsylvania, appointed to do so, brought in at Memphis a comprehensive report outlining how such a bureau could be created. Without a bureau with experts to advise and correlate the investigation of the different states, there will be much duplication of work, much groping for methods and much confusion in results. Two years ago, the resolution was presented. Up to the present, no constructive action has been taken. The bureau should have been organized immediately after the Denver meeting and the Officers and Delegates could have been presented at Memphis with a scientific report outlining the scope and extent of potential contract and insurance development in the United States. At this meeting, we could have had a further report and would have been in a position to discuss a possible program for our local, state and national bodies. We could have correlated our finding with the Bureau of Economics of the American Medical Association and the two professions could have at least approached the possibility of presenting a united front. Instead, we find the minds of many of the rank and file as well as the leaders tenanted by bewilderment and confusion. Instead of our using well ordered scientific methods in the study of our problems as all large well managed institutions should, chaos and reaction are with us.

In an article written by our President in the September issue of the A. D. A. JOURNAL, the rapid growth of contract dental practice in Oregon is discussed. He reports the refusal of the members of the state society to work under the contracts and the acceptance of these contracts by nonmembers. He also quotes figures to show that only 50 per cent of the dentists in the United States are society members. We ask, are not the problems involved in the solution of the Oregon contract practice vitally important, and pregnant with good or evil? Should they not be dealt with now? Should not all the resources at our command be mobilized to meet this issue in its formative period?

Our President says: "The question of contract dentistry, state dentistry and health insurance must receive attention in the future," because, he says, "these questions are being brought forward by socialistic groups." Are the contract agents socialistic? Or are they hard boiled profit seekers in a new field who rather enjoy being called "socialistic" as long as it muddles thinking and prevents professional action? Confusing an issue is not an evidence of leadership. Putting off for the future action that

should be taken today is not an evidence of statesmanship.

Lack of understanding inhibits clear thinking. Without clear thinking, it is impossible to visualize the proper relation of professional organizations to society as a whole. Last year at the Memphis meeting, the successful candidate for the high office of President Elect was nominated in the House of Delegates as a man who stood "four square on the platform of *dentistry for dentists*," as "a man who would safeguard *our* interests, fight for *our* rights against will-of-the-wisps such as panel dentistry, insurance dentistry, state control, low fee clinics, corporation dentistry, etc."

To refer to panel dentistry, insurance dentistry, state control, low fee clinics, corporation dentistry as will-of-the-wisps is a result of the same type of thinking as that which says they are "socialistic." These so called socialistic will-of-the-wisps are not gaseous emanations from swamps hidden in the minds of malevolent agitators but are stern realities made up of cold logic and real facts. "Four square on the platform of *dentistry for dentists*"—here is the will-of-the-wisp of an idea which if followed will land our professional ideals and traditions in the bog of trade union tactics and commercialized ethics.

"Plumbing for plumbers," with the strike, the boycott and the racket, yes; "teaching for teachers," no; "science for scientists," no; "dentistry for dentists," never.

In the same number of the A. D. A. JOURNAL containing the President's statement is a paper written by the editor, headed, "Present Day Tendencies." In the course of the article the editor states:

> We hear repeatedly the hue and cry that only about 20 per cent or at most 30 per cent of the populace ever apply to the dentist for service other than the possible extraction of a tooth, and that the problem to be solved is to induce the other 70 or 80 per cent to seek service. Frankly, I have never been able to convince myself that this 20 per cent estimate was accurate, and even if it were, I see no need for the profession to get so wrought up about it.

The implications of the statements just quoted, if accepted, as they are at present by many, would take away all point and value from this paper in which the contentions are, first, that facts indicate that only *20 to 30 per cent* of the people get any degree of adequate dental care, and second, that it is the *professional responsibility* of organized dentistry to become "wrought up" over devising ways and means for making dental service available to those who do not now receive it.

In proof of part one, we offer the estimate of Dr. Maurice Leven to the effect that 24,400,000 different persons out of 123,000,000 population received dental care in 1929. This estimate is accepted by experts in the field of statistics as authentic. It is based on replies from a sample of over 5,000 dentists in twenty states as well as returns from other studies. The Committee on the Costs of Medical Care had 10,000 families scattered in all income groups keep record of their medical and dental expenditures over a period of a year.

The accompanying tabulation gives an idea of the amount of dental care received by the families at the different income levels.

Family Income Under	Average Families Who Received Dental Care
$1,200	10.1
1,200 — 2,000	16.1
2,000 — 3,000	21.7
3,000 — 5,000	28.1
5,000 — 10,000	41.5
10,000 and over	58.8

These figures should remove all doubt from unbiased minds as to the small per-

centage of people who receive dental care.

An analysis will illustrate our second contention. Dental disease is an etiologic factor in many degenerative and disabling diseases. Dr. Ralph Pemberton, in his recent book on arthritis and rheumatic conditions, says that in 700 cases of arthritis, the teeth constitute the site of most of the focal infection. Heart lesions, nephris, gastric ulcer, gallbladder infections are in many cases related to dental disease. The liability of dental pathologic processes is not petty. The universality of oral disorders and their effect on the life span gives our responsibility serious proportions and national significance.

Rocky Mountain fever is confined to a small area in the United States and affects a small number of people, yet the United States Government has spent thousands of dollars to control it. Professional men, true to traditions, became "wrought up" over the situation and at least four have, in this instance, given their lives in assuming professional responsibility.

Many of the 70 or 80 per cent who are not getting dental care are children. Should we not get wrought up over them? The White House Conference on child health and protection in its charter pledges itself to aim to secure, among other things:

> For every child from birth through adolescence including: periodical health examinations and, where needed, care of specialists and hospital treatment, *regular dental examination and care of the teeth;* protective and preventive measures against communicable diseases; the insuring of pure food, pure milk, and pure water.

Many uncared for are working men and women. Should we not get "wrought up" over them? Lay groups, social workers, governments, industries are "wrought up" over their health problems.

Dare we of the professions involved in health service say "We are not interested, we are not 'wrought up' over the fact that a large part of the people do not get dental care"? Does it sound patriotic? If we did say this, could we come into the court of public opinion and plead that our profession rather than contract agents or insurance companies have the welfare of the public at heart? Our pleas would be ignored; we would lose professional position and prestige, economic status and income.

Dentistry represents a vast social investment. It has to offer the public a splendid developing group of dental schools turning out the best trained dentists in the world; research groups who are struggling to solve pathologic and biologic problems; 60,000 practicing dentists with a mass of professional knowledge and skill; accumulated professional ideals and traditions; and all these have no meaning, no value, unless their potential dental service has a clear channel through which to flow to the American people. To create a dental service and to cut the channel that will carry this service to every man, woman and child who needs it is the professional responsibility of American dentistry.

The fact that the public are careless and heedless, that industry does not pay sufficient wages, that the wages are not spent wisely are all obstacles in the way, but they do not lessen our professional responsibility. The public's weal is the profession's goal.

We can be sure public opinion would accept our leadership under these conditions. We can be sure they will accept it on no other terms.

Dentistry is a young profession, less than 100 years old. The general health menace of dental disease is a new dis-

covery. Only a part of the population realize this menace. We hold in our hands the opportunity of giving leadership to methods for the extension of oral health to the large group in the population who do not now receive it. We can joyously approach the problem in the same fine, scientific spirit as animated the men who have conducted medical and dental research. And we can be sure that to plan an organization of health service which will make possible more adequate medical and dental care to the masses is as socially and professionally valuable as discovering lymphatics in the peridental membrane or demonstrating rickets and caries in underfed rats.

But few individuals can get a thrill from the latter discoveries, while a whole profession can experience creative joy in planning for healthier lives for the American people.

In closing, I want to point out to the young men in dentistry that planning such health service is a problem offering a challenge to the highest type of constructive idealism. Here is a field worthy of your most earnest thought and effort.

You could make no greater contribution to your profession than to prepare yourself to help pilot the ship of dentistry through what Dr. Prince has so well called "the maelstrom of political and social change that is just ahead."

GOVERNMENT COMPETITION WITH PRIVATE PRACTICE

By EMIL L. AISON, D.D.S., Chicago, Ill.

THE controversy over government competition with private dental practice makes it important to review not only government competition with medical practice, of which dentistry is a subdivision, but also the whole matter of the present status of veterans' compensation. When the United States emerged from the World War, it found itself faced with the necessity of hospitalizing thousands of its soldiers, wounded, ailing and suffering from various disabilities incurred as a direct result of the war. The emergency was met with the building of government hospitals calculated to care for about 300,000 men disabled from war service; and this without protest from either tax payers or the professions because it was recognized that a great emergency existed.

In 1924, it was found that these institutions were greatly overexpanded for existing legitimate needs and the idea was advanced that they be used for veterans with disabilities of nonservice origin, and at once there was a great demand for the building of more hospitals and institutions. As a result, building of veterans' hospitals became a porkbarrel for congressmen, such hospitals being demanded by civic and commercial associations and business organizations as an asset to the community.

Many of these institutions were built without any active solicitation on the part of veterans' organizations. Later, a plan was outlined by the United States Veterans' Administration which would make it possible to care for all types of medical, surgical or other conditions among veterans, mostly of nonservice origin, of about 4,000,000 veterans of the World War. This plan, which virtually meant a raid on the United States Treasury, was proposed at a time when civilian hospitals and the medical and dental professions of the country as a whole were experiencing the greatest economic struggle.

That the cost of veterans' compensation has reached a point where it requires careful consideration is indicated by the following items of the federal budget for the year ending June 30, 1933. Especially do these figures demand consideration at this time, when the government is financially embarrassed and is having difficulties in balancing the budget, and particularly when no distinction is being made between veterans who need help and those that do not.

1932 Budget:	
Veterans' relief,	$928,000,000.
1922 Budget:	
Veterans' relief,	$660,000,000.
1912 Budget:	
Veterans' relief,	$153,000,000.

It is interesting to note that the latest appropriation for veterans' relief exceeds that allowed for national defense by $279,700,000 and that of public works by $389,900,000.

One does not fully realize the enormity of the government's inroads on private practice unless he studies the annual report of the Administrator of Veterans' affairs for the year 1931 (last available). In this, we find that there are sixty-six veterans' hospitals now existing or to be completed by July 30, 1933, with a total capacity of 45,000 beds. This is exclusive of the hospital beds normally required for the treatment of soldiers in the national homes.

Admissions to all hospitals during 1931 show that more than three fourths of the total were of the nonservice class. To date, congress has authorized expenditure of the sum of $113,327,000 for new hospitals and domiciliary and outpatient facilities. In addition, Congress has over the same period authorized by special acts expenditure of the sum of $9,425,000 for new domiciliary and hospital construction at national homes. Further, there has been expended since 1923 more than $14,000,000 from regular fiscal funds for permanent improvements and extensions to veterans' hospitals.

Under the consolidated plan of veterans' relief, the scope of the present Veterans' Administration can best be illustrated by the number of veterans or their dependents who are at this time receiving direct financial benefits at the hands of the Government. As of June 3, 1931, the latest data available, exclusive of the benefits of insurance, adjusted compensation, hospital or domiciliary care and civil service retirement, there were on the rolls of the Veterans' Administration 1,349,812 beneficiaries. The portent of this gigantic bureaucratic set-up is best appraised when one realizes that to care for the affairs of veterans requires a personnel of nearly 35,000 with aggregate annual salaries of $58,440,992. These figures are exclusive of all other government institutions, such as Army and Navy hospitals, United States Public Health Service, Indian service hospitals and others, of which there are about 225.

THE DENTAL PHASE OF VETERANS' RELIEF

Dental relief rendered beneficiaries in recent months shows a marked increase over that furnished during recent years. This increase is due principally to the amendment of July 3, 1930, to the World War Veterans' Act, which provided an allowance to veterans of the World War, for disabilities not necessarily contracted in line of duty.

The value of dental service rendered veterans during the year 1931 computed on a fee basis amounted to $1,196,244.08, of which $908,956.85 was furnished by veterans' hospital clinics and $287,287.23 by outpatient clinics attached to regional offices. Fifty-two and a half per cent of these dental patients were treated not only for disabilities of service origin, but in addition for disabilities of nonservice origin. In 1931, 29,491 patients confined to veterans' hospitals were treated, 25,406 cases being completed, an increase of about 5,000 over the previous year. In addition, 6,359 cases were treated by private practitioners in 1931 at a cost to the Government of $286,443.15 when it was more practical to obtain treatment through this source. In the outpatient departments, 86,980 dental patients were treated. In 1931, the number of dental patients examined with roentgen rays were as follows: in Government dispensaries, 14,183; in hospitals, 20,169. The figures on the cost of this service are not available.

The Hines hospital at Hines, Ill., a veterans' institution with a bed capacity of 1,655, has a dental department, we are reliably informed, consisting of ten full-time dentists; four dental nurses and an administrative and clerical staff; with eight operating chairs, one examining chair, one dental x-ray unit and accessory equipment necessary to perform dental operations. There is also a central dental laboratory which cares for the construction of dentures from nine regional office clinics and fifteen hospital clinics within overnight mail service from Chicago. During the period Oct. 1, 1930 to June 30, 1931, the laboratory constructed 1,593 dentures of various types. The laboratory employs one senior dental mechanic and seven dental mechanics with an annual salary roll of $17,300.

One can only picture the enormous cost to the people for the maintenance of so vast an army of government employes to administer such a gigantic scheme. Of course, no private practitioner in medicine or dentistry can practice in a government hospital. This must be done by employes of the government. The greater impediment in arriving at an understanding as to cost results from the consistent refusal on the part of the Veterans' Administration to permit studies of the cost of veterans' care and its consistent opposition to the care of veterans in home hospitals and by local physicians and dentists. This is the danger of bureaucracy. Once a bureau is established, it will do everything it can to grow bigger and more powerful and, in doing this, will necessarily meddle with affairs which are not a proper sphere of government activity.

In an address before the Union League Club in Chicago, Nov. 27, 1932, Admiral Sims, a member of the National Economy League, dwelt at length on abuses in the pension administration. He stated that one half of the 1933 appropriation of $928,000,000 for war veterans is paid in connection with disabilities not incurred in war service. He further stated that, under the present laws, the annual cost of World War

pensions will be one and one half billion dollars by 1942, taking 35 cents out of every tax dollar. General Hines, head of the Veterans' Administration, states that by 1940 the administration will have spent eleven billion dollars. In another decade, this expenditure will have equaled the whole cost of the war —twenty-two billion dollars. To a congressional committee, General Hines stated that the cost is increasing at a staggering and a dangerous rate, and we have not yet felt the full force of the present legislation.

The original intent of the laws enacted in favor of our war veterans and for the rehabilitation of the service men who were incapacitated through active war duty has been lost sight of. Today, privileged legislation indiscriminately entitles anyone who has been in any way connected with the army to treatment of disease, medical or dental, not contracted in the service of this country, at public expense.

This has not only increased the burden upon the American people, who pay the bill, but also is the forerunner of a government paternalism which will prove most demoralizing in its effects on the very beneficiaries of the system, as well as the medical and dental professions.

From the foregoing, it can be readily seen why leaders of both the medical and the dental profession have watched government competition with private practice with grave concern. Today, a situation confronts us which makes vigorous action necessary if the taxpayer is to be relieved of an unjust burden and the veteran himself saved from pauperization, and if the high standards of our own profession are to be preserved. The House of Delegates of the American Medical Association passed a resolution at Philadelphia organizing a committee and proposing plans to cope with the situation. At the meeting of the House of Delegates of the American Dental Association at Buffalo, in September, Thomas B. Hartzell presented a resolution calling for an expression by that body to the effect that it is unalterably opposed to the continued use of money raised by taxation in competition with the dental profession. In October, at a meeting of the Dental Economics Committee of the Chicago Dental Society of which M. D. K. Bremner is chairman and I am a member, at the suggestion of F. Van Minden a special committee was appointed to appear before the Shannon Congressional Committee, which was to hold hearings in Chicago in November for the purpose of investigating government competition with private business, and, on behalf of the Chicago Dental Society, to voice a protest against government competition with private dental practice. As chairman of that committee, I appeared before this commission, Nov. 16, 1932. At that hearing, it was emphasized that the Chicago Dental Society is in complete sympathy with the legitimate demands of the service men; that it is not at all opposed to rendering service to war veterans for dental ailments and defects incurred in line of military duty and that this society is in full accord with the principle of extending every possible aid and assistance to this class of veterans. It was submitted that the society does object most strenuously to the extension of dental service to veterans for ailments and defects not caused by actual war service; and, further, that this unnecessary and unjustified extension of the function of the federal government increased the tendency of dependence of the veterans on the government; also that the effect on the dental profession is equally bad in that private initiative will be de-

stroyed and scientific standards lowered, and that, in the last analysis, the Government actually reduces the legitimate income of the individual dentist. Evidence of gross and flagrant abuses of the system not generally known to the rank and file, who are not acquainted with the many evils and political ramifications of government participation in business or the professions, were presented in the record.

At this time, it can be stated that while the Shannon Committee lent a sympathetic ear, was interested in the problem and endeavored to obtain for its records all information tending to throw light on the injustice done to the taxpayer and the profession, the impression left with our committee is that there is need for a more organized demand by the whole profession if the expanding evil is to be eradicated. The inquiry has developed facts enough to command action by our government.

However, the stress of the vexing problems to be solved in connection with the present economic upheaval of the nation, and the pressure from other business interests with their organized lobbies at Washington, may cause a sidetracking of the interests of medicine and dentistry unless we are on the alert. We therefore need, we believe, a strong organized demand, with enough direct and practical pressure on legislators and party leaders to overcome indifference, evasion and bureaucratic opposition.

The Shannon committee has taken thousands of pages of testimony gathered throughout the country and the revelation is overwhelming. The growth of Government enterprise competing with private business and professions has been gradual and little noticed, but it has been swift and its entrenchments are stubborn. Congress has every reason to act with promptness and vigor. It is one of the chief concerns of our next administration; but action will be grudging and slow unless the public, and especially the business, professional and labor organizations of the nation, wake up to their own interests and bring direct and vigorous pressure to bear on politics to compel immediate relief.

The professions have been facing government competition, practice by corporations and threats of state medicine and dentistry. At this very writing (Nov. 30, 1932), the press announces a majority report of the committee on the study of costs of medical and dental care, of which Ray Lyman Wilbur, a medical man and a member of President Hoover's cabinet, is chairman, advocating a revolutionary change in the American system of private and personal relationship between patient and doctor. This committee, which has been supported by eight of the most powerful foundations financially considered, would have us adopt insurance and other schemes which would deprive the people and the professions of their traditional self-respect.

Whether this nation is in favor of state socialism either by revolution or evolution, only the future will tell; but the process of bringing such a state about artificially by threats or fear should be challenged by the organized professions if they are to fulfil their duty and their mission, and should be arrested without further delay. It is a drain on the nation that we cannot afford and is destroying not only our liberty and prosperity but also the finest traditions of American life and scientific professional progress. These issues must be met now.

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FACING PANEL DENTISTRY

By D. T. PARKINSON, D.D.S., Wichita, Kas.

THERE is no more vexing question before the dental profession today than that of so-called panel dentistry. That state dentistry and state medicine are very definitely indicated in this country, no one can deny. There is an insistent demand for unemployment insurance, for city, county or state clinics, offering free medicine, free dentistry and free hospitalization, not only for children but for adults as well. A vast amount of time and money have been expended in investigation, and while our investigators seem to agree that we are probably confronted with the regrettable fact that some such scheme is inevitable, they have as yet been unable to formulate any definite or satisfactory plan for its practical application to professional service in America. And while we wait, other organizations are seeking a solution of the problem. It is therefore time for the professions to become alert to the situation and undertake to see to it that our leaders have a large part in shaping the ultimate plan.

Some legislation already passed should indicate to us the popular trend at least. A few years ago, a law was introduced into the legislature of Massachusetts providing for state dentistry for everybody regardless of station in life or financial worth. Dentists were to be employed by the state at stipulated salaries depending solely on the number of years since graduation, all dentists then practicing to be eligible to registration as state dentists, and registration to be purely voluntary, the law also providing that, in case enough dentists had not registered within a definite time to supply the demand for state service, the state should then undertake the education of young men who, on graduation, would and could practice only as state dentists. Large clinics would be established where any citizen of the state might apply and all dental service would be rendered free from personal expense.

We now have in Kansas a crippled children's law which defines a crippled child as "any person of sound mind and under 21 years of age who is afflicted with any deformity or chronic malady which may be materially benefited or cured by treatment." The broad interpretation of

this law includes everything from cross-eyes to ingrowing toenails, crooked teeth and infected tonsils. These cases are cared for at state expense under appointed physicians, at designated hospitals and at specified fees. Anyone either wholly or in part unable to pay for treatment is entitled to state aid.

The law requires that each county must levy one tenth of one mill in taxes for this purpose, the fund to be kept separate from all other funds and used only for the purpose of caring for these cases. In Sedgwick County, the fund amounts to about $20,000 a year. This is state medicine pure and simple with all its limitations and political possibilities.

The United States Veterans Bureau under the Act of Congress of 1925 is authorized to establish hospitals in various sections of the country for the treatment, both medical and dental, of disabled veterans. Service rendered to dental patients in 1931 by the bureau amounted to $1,482,687.23. This bureau established its own dental laboratory at Hines, Ill., in September, 1930, and, in the following eight months, turned out a total of 1,593 dentures.

Legislation has been introduced into the United States Congress to extend these services to include all members of the veterans' families; which would make about twenty million people eligible to free medicine and dentistry under the Government.

There is growing up an insistent demand for unemployment insurance and a sentiment for publicly maintained clinics offering free dental care, free medical care and free hospitalization, not alone for children, but for everybody.

If these indicate the trend of the public mind, and I believe they do, some of the important factors in their development may be of interest.

CHILDREN'S CLINICS

As originally planned, all systems of Government-controlled or free dental services were designed as poverty measures. They were efforts to provide dental service for those who are financially unable to provide such service for themselves. We, in America, have given our support to this idea practically unanimously.

Several years ago, Mr. Forsyth, of Boston inspired by his personal dentist and encouraged by organized dentistry put a million or more dollars into the Forsyth Dental Infirmary for Children. It was to serve the poor. It was to establish dental health where it could not otherwise be obtained. It was a beautiful philanthropy and so heralded and proclaimed by the entire profession. No one looked on it as a potential drain on the regular practice of dentistry. Later, Mr. Eastman built a similar institution in Rochester, N. Y. Dentists were all vitally interested and began to suggest ways and means for establishing such clinics and infirmaries in our respective localities.

PUBLIC SCHOOL EXAMINATIONS

Lacking a sufficient number of such philanthropists, we undertook the wholesale examination of children in the public schools. To get the program started, we gave our time without remuneration that we might have a chance to prove to the school boards and to the community that there is a very definite relationship between bad or poor mouth conditions and scholarship, that children with decayed or abcessed teeth, with malformations, adenoids, etc., are, as a class, slow in their studies and dull of mind, soon get behind their grades and become repeaters, thereby causing additional expense for education, and that they also quite often offer the worst problems in discipline. They are also most often subject

to the various contagious diseases of childhood and, when they return from quarantine, there is all too often a fresh outbreak of the contagion because these children are carriers of the disease germs.

School boards were convinced and the parents of the children as well. In some states, we had laws passed making it compulsory for all school boards to provide examination of the children's teeth at least once each year. Many children were brought to our offices as a result of these examinations, but we were immediately confronted with the problem of the poor, those who could not pay our fees, and there were many of them—more, perhaps, than we expected there would be. In Rochester and Boston, the problem was largely solved by the infirmaries referred to, but in my town and yours something else had to be done. In some places, we succeeded in persuading the school boards to establish clinics under the supervision of their health departments and employing one or more dentists as the needs developed. In Wichita, we started with one dentist working two half-days a week. As the work progressed, the number of dentists was increased, until there were four, each giving five half-days of each week during the school year. Other cities had like experiences; which coincides with the opinion expressed by students of government or free service that, in every instance where free dental service has been offered to any class of people, there has been a steadily increasing demand for it.

INDUSTRIAL CLINICS

Not only did we educate the public regarding the care of children's teeth, but we also began a wholesale campaign of health dentistry education intended to reach every possible man and woman in the country. We intended to arouse the interest of the people in the care of their mouths. We induced industrial plants to establish dental clinics for the benefit of their employes and to require periodical dental examinations and the completion of all necessary dental operations. In many institutions, this dental service was rendered without charge or expense to the employe because the better health thereby insured made him a more efficient worker and therefore his employer could well afford to bear the expense incurred.

PUBLIC HEALTH EDUCATION

In our enthusiasm for public health education, we arranged for lectures before parent-teacher associations; we talked to medical societies; we published educational articles in the public press; we went on the air to address millions of people through the radio. All these activities and many others were sponsored by various dental societies. Then came various commercial organizations contributing as best they could to health education intermingled with certain ideas that might be considered questionable but nevertheless doing for the dentist that which he could not well do for himself.

The people must be made "mouth conscious"! What for? I am not going to say that our efforts are entirely altruistic. Our program is both altruistic and selfish. It is altruistic because we wish to make every individual as comfortable and happy as possible, to prolong his usefulness as a citizen and a workman and to extend the normal span of human life. As guardians of the public health, we have undertaken to partially fulfil that mission through dental health education. We have convinced ourselves of the relation which may exist (you will note that I say "which may exist") between any sort of focal infection about the teeth and remote organic disturbances. We are sure that hundreds or thousands of people are suffering from broken health and

impaired ability to perform their regular duties in life and industry because of unhealthy oral conditions.

Our program of health education is selfish because we are the only class who can keep the public in oral health. The parents, having been convinced of this, will bring their children to our offices. We have taught the public to realize the necessity for oral health, and have instilled in them the desire for dental care and they must come to us for it, since we alone can render this service.

ECONOMICS

Our teachers of dental economics and our dental manufacturers, under the guise of dental salesmanship or business promotion, have taught us that there are vast opportunities for remunerative dental service among the people who do not now visit the dental offices. According to the best statistics available, it seems to be a fact that only about 20 per cent of the people are dental patients. The remaining 80 per cent have been looked on as potential dental patients; while the real facts are that practically this entire number are unable to afford even the most meager dental service, if any at all —a situation which seems to have been entirely overlooked by our propagandists and economists and is, in my opinion, a direct cause of the dilemma in which the dental profession now finds itself in confronting the matter of state or panel dentistry.

These percentages of 20 and 80 have often been questioned, but, as far as I know, no one has taken the time to analyze them. Let us "take a look" at them.

There are about one hundred and twenty million people in the United States. If 20 per cent (about twenty-five million) are now dental patients, there remain ninety-five million in the unserved 80 per cent. Of these, twenty-four million are children under 9 years. Eight million are past 65 years. Fourteen million are colored. Three million are Mexicans, Japanese, Indians, etc. There are about five hundred thousand in homes and institutions where dental service is furnished them. It is now estimated that at least thirty-five million are without support because of unemployment. Under legislation passed by the House of Representatives last May, all hospital benefits of the government to veterans, of whom there are about four million, were extended to include the members of the families of the veterans, which, if put into effect, will include about sixteen million more.

By these figures, we find that about one hundred and five million people cannot be counted as potential dental patients. If it is said that it is not fair to include the families of veterans in these figures, the picture is not greatly changed for there will still remain about ninety million in the impossible or unprofitable group.

Unserved population	95,000,000
Children under 9 years	24,000,000
Adults over 65 years	8,000,000
Colored population	14,000,000
Mexicans, Indians, etc.	3,000,000
In homes and institutions (est.)	500,000
Unemployed	12,000,000
Unemployed dependents	24,000,000
Veterans	4,000,000
	89,500,000
Veterans' families	16,000,000
	105,500,000

Now if we look at this 80 per cent from a different angle, we will have a different picture, but no more encouraging. In 1918, the National Bureau of Economic Research prepared the following table of estimated family income for all the population of the United States, counting 5 as the average family.

Under $1,000	69.63%
Under 1,500	72.01%
Under 2,000	85.92%
Under 3,000	94.08%
Under 5,000	98.38%
Over 5,000	1.62%

In 1919, the United States Bureau of Labor issued the statement that the minimum income on which a family could maintain a bare standard of decency and health in the country was $2,100. It is readily seen, from these figures, that, at that time, more than 85 per cent of the population was living below the minimum of bare decency and health.

Economists tell us that, in 1928, economic conditions in this country had more nearly reached the state of Utopia than it has ever been reached by any nation in the history of the world; yet, even under such ideal conditions, more than 68 per cent of the population were then below the level of subsistence, or decency and health. Under present-day conditions, this economic distress is about 73 per cent and it is rapidly increasing.

The crash came in 1929. It was about this time that the agitation about panel dentistry arose. People do not as a rule appeal to charity as long as they are able to supply their own needs, or have reasonable hope of doing so. Before the financial crash, the mass of people, regardless of income, were filled with hope. They felt that they were on the way up and that soon they would be able to secure for themselves and their families this needed and necessary dental service which they had been educated to desire. Hope vanished with the crash. The education and the need did not vanish. The need rather became all the more urgent. Good health and physical fitness were all the more essential. Loss of income was bad, but loss of income plus loss of health was much worse.

WELFARE SOCIETIES

A tremendous interest now developed outside the medical and dental professions among the various social and welfare agencies. These agencies are nowhere in the world so well organized as in the United States. They are backed by great minds, by great donations and foundations, by religious organizations. They are led by able, prominent and influential persons. They have even entered into the field of politics to gain their purposes. They have established public nursing organizations, great charity hospitals and sanitariums for children, cripples, the aged. There are approximately one million people engaged in public health work. Of these, two hundred and ten thousand (less than one-fourth) are physicians and dentists.

These social and welfare workers are concerned with the problem of health and of poverty. These problems always go hand in hand. The greater the poverty, the higher the percentage of ill health and suffering. In a large part, the solution of these problems lies in adequate medical and dental service.

It is largely from these welfare workers that the sentiment comes that "dentistry must be furnished at a price which the people are able to pay." How many dentists are getting more for their work than their patients can afford to pay? None, of course. The difficulty lies in the fact that we have not been looking at the population as a whole, but only at that portion that has been coming to our offices. Out beyond them is the large mass of people whom we have been educating to the necessity for dentistry, with little or no thought as to how they were to secure it. Hence, the inevitable. What the mass of the population is unable to provide for themselves, they will sooner or later demand to have provided for

them. We need not be deceived: What 80 per cent of the people demand, that they will have. If through no other channel, then by way of the vote-getting politician, whose ears are always open and whose eyes are always watching the weather vane of public or popular opinion to see which way the votes are blowing.

THE DOLE

The dole has not yet arrived in the United States, but the dole sentiment has. We may call it social insurance, employment insurance, unemployment insurance or any other name, but a garlic by any other name would smell as bad. In the countries where these systems now exist, inquiry shows that the laws were first suggested by welfare and uplift workers in trying to solve the same problems of poverty and health that are being worked on today in this country. State medicine and state dentistry are an adjunct to the dole system. That this service has so largely come under the control of the politicians is perhaps due to these social and uplift workers' playing into the hands of the politicians to gain their ends. The politicians saw in such legislation an additional means of building up a political patronage that would help to maintain them or their party in power; for the more patronage individuals or a party has to pass out in jobs, etc., the more certain they are of being continued in office.

It is all well enough to proffer sympathy for the great masses of people who are unable to provide themselves with adequate dental service and to conclude that the government through cities, counties or states should make provision for all such at public expense, but don't forget that we are the public and we must pay the bill. It is useless to cry out against high taxes and then vote for such enormous expense to be assumed by the government. In England today, incomes of $750 a year are taxed 25 per cent. Higher incomes carry higher tax percentages. (And yet some people say that conditions could not be worse in this country). England's dole is costing billions of dollars a year. If you want to know how much a billion dollars is, work this problem. Get yourself a job at one dollar a minute, work every minute of every hour of every day of every year, and in two thousand years you will have a billion dollars.

What's the answer? I do not know. I am offering no solution. I am only trying to point out the path over which we have been traveling thus far. I am neither critical nor pessimistic. The leaders of the professions are gathering information, and we of the common class must keep ourselves informed on the signs of the times. Perhaps the greatest danger that confronts the profession today is that, under the stress of business depression, we will launch out into some new scheme or program the final result of which will prove to be disastrous, although seeming to offer immediate or temporary relief. Some writers tell us that panel dentistry is only a specter, arising out of the night of depression, to scare us. Others say it is an inevitable situation. The unemployed are demanding unemployment insurance, and if that comes, it inevitably means state medicine and state dentistry. Our unemployed are being led along the same paths as the Europeans have been led. We may try to keep free from foreign problems and take pride in our isolation, but we are no more safe than the ostrich with its head under the sand. We had better get our heads up and our eyes open and be ready to meet whatever may come.

FINAL REPORT OF COMMITTEE ON THE COSTS OF MEDICAL CARE*

FIVE years of work by the fifty members and research staff of the Committee on the Costs of Medical Care have culminated in this final report, entitled "Medical Care for the American People." The majority report was favored by the following:

Private Practice.—Lewellys F. Barker, M.D.; Walter P. Bowers, M.D.; J. Shelton Horsley, M.D.; Stewart R. Roberts, M.D.; Richard M. Smith, M.D.; Walter R. Steiner, M.D., and Rollin T. Woodyatt, M.D.

Institutions and Special Interests.—W. Irving Clark, M.D.; William Darrach, M.D.; Louis I. Dublin, Ph.D.; Elizabeth Fox, R.N.; Ambrose Hunsberger, Phar.M.; Alfred Owre, D.M.D., M.D.; W. S. Rankin, M.D.; Mary M. Roberts, R.N., and Winford H. Smith, M.D.

Public Health.—George H. Bigelow, M.D.; Herman N. Bundesen, M.D.; Haven Emerson, M.D.; John Sundwall, M.D., and C. E. A. Winslow, Dr.P.H.

Social Sciences.—Michael M. Davis, Ph.D.; William T. Foster, Ph.D.; Wesley C. Mitchell, Ph.D.; William F. Ogburn, Ph.D., and Henry C. Taylor, Ph.D.

The Public.—Winthrop W. Aldrich; Morris L. Cooke, D.Sc.; Mrs. William Kinnicutt Draper; Homer Folks, LL.D.; John P. Frey; Mrs. Walter McNab Miller; William J. Schieffelin, Ph.D.; Amelia Sears, and Ray Lyman Wilbur, M.D.

*Reprinted from The Journal of the American Medical Association, Dec. 3, 1932.

A summary of the majority report follows:

I

"The Committee recommends that medical service, both preventive and therapeutic, should be furnished largely by organized groups of physicians, dentists, nurses, pharmacists and other associated personnel. Such groups should be organized, preferably around a hospital, for rendering complete home, office and hospital care. The form of organization should encourage the maintenance of high standards and the development of preservation of a personal relation between patient and physician.

II

"The Committee recommends the extension of all basic public health services—whether provided by governmental or nongovernmental agencies—so that they will be available to the entire population according to its needs. This extension requires primarily increased financial support for official health departments and full-time trained health officers and members of their staffs whose tenure is dependent only on professional and administrative competence.

III

"The Committee recommends that the costs of medical care be placed on a group payment basis, through the use of insurance, through the use of taxation, or through the use of both these methods. This is not meant to preclude the continuation of medical service provided on an individual fee basis for those who prefer the present method. Cash

benefits, i. e., compensation for wage-loss due to illness, if and when provided, should be separate and distinct from medical services.

IV

"The committee recommends that the study, evaluation and coordination of medical service be considered important functions for every state and local community, that agencies be formed to exercise these functions, and that the coordination of rural with urban services receive special attention.

V

"The Committee makes the following recommendations in the field of professional education: (A) That the training of physicians give increasing emphasis to the teaching of health and the prevention of disease; that more effective efforts be made to provide trained health officers; that the social aspects of medical practice be given greater attention; that specialties be restricted to those specially qualified; and that post-graduate educational opportunities be increased; (B) that dental students be given a broader educational background; (C) that pharmaceutical education place more stress on the pharmacist's responsibilities and opportunities for public service; (D) that nursing education be thoroughly remolded to provide well educated and well qualified registered nurses; (E) that less thoroughly trained but competent nursing aides and attendants be provided; (F) that adequate training for nurse-midwives be provided, and (G) that opportunities be offered for the systematic training of hospital and clinic administrators."

The first chapter surveys "The Present Status of Medical Care." It reports that 177,000 physicians and dentists, with some 900,000 others at an annual expense of $3,647,000,000, so distribute their services that those in the lower income groups, while suffering as much or more sickness, receive far less medical service than those with a greater income.

There is a lack of preventive health care; indeed, "niggardly appropriations for public health work." The burden of sickness cannot be measured by averages, because of the extreme unevenness with which it is distributed. Fifty per cent of the families in the United States have incomes of less than $2,000, which means that "even less-than-average charges for medical service, therefore, are more than many of our families can bear."

One conclusion reads: *"Certainly no solution to the problems of medical costs can be reached through a reduction in the average of professional incomes"* (italics in original). This average is none too high now to attract a high type of practitioner and permit progress through graduate training and study.

The Committee attempts from the report of some of these investigations to calculate the cost of complete medical care and concludes that "all needed medical care of the kind which people customarily purchase individually could be provided in urban regions at least, at a cost, excluding capital charges, of $20 to $40 per capita per annum."

The second chapter discusses "The Essentials of a Satisfactory Medical Program." Six basic essentials are enumerated:

"1. The plan must safeguard the quality of medical service and preserve the essential personal relationship between patient and physician.

"2. It must provide for the future development of preventive and curative services in such kinds and amounts as will meet the needs of substantially all the people and not merely their present effective demands.

"3. It must provide services on financial terms which the people can and will meet, without undue hardships, through either individual or collective resources.

"4. There should be a full application of existing knowledge to the prevention of disease, so that all medical practice will be permeated with the concept of prevention. The program must include, therefore, not only medical care of the individual and the family but also a well organized and adequately supported public health program.[1]

"5. The basic plan should include provisions for assisting and guiding patients in the selection of competent practitioners and suitable facilities for medical care.

"6. Adequate and assured payment must be provided to the individuals and agencies which furnish the care."

Having set up these standards, the Majority Report selects three lines of approach to the solution of its problem:

"(*a*) The development of types of organized or group practice that will more effectively and economically meet the community's medical needs.

"(*b*) The distribution, over a period of time and over a group of families or individuals, of the costs of service.

"(*c*) Provision for the planning and coordination, on a local and regional basis, of all health and medical services."

It is evident that the program of the Majority Report centers around "provision of service through organized groups." The groups studied on which conclusions are based covered only fifty such groups; conclusions as to the financial operation of such clinics and especially as to their net and gross income are based on the information furnished by twenty-seven such clinics.

The Majority Report sets up "standards" for group practice and among these emphasizes the statement that *"lay groups organized for profit have no legitimate place in the provision of this vital public service"* (italics in original). This standard, the Committee seems to fail to note, would eliminate many of the examples of group practice on which it depends for the argument previously mentioned leading to the estimate of annual cost.

"Inevitably the Committee has been led to the conclusion that the costs of medical care should be distributed over groups of people and over periods of time." This leads to the adoption of insurance as a major recommendation. The participation of insurance companies is rejected and taxation accepted only in a secondary form. Having eliminated these, the Majority Report is brought to the somewhat indefinite conclusions that "there should, therefore, be an agency in each community through which the lay and the professional groups concerned in providing and financing medical services could consult, plan and act in behalf of the best provision of medical resources which the community can afford." The character of this "agency" remains indefinite throughout the report.

Chapter three sets up "An Ultimate Objective in the Organization of Medicine." "The keystone of the concept of a satisfactory medical service for the nation is the development of one or more non-profit 'community medical centers' in every city of approximately 15,000 population or more." Then follows a description of such an imaginary center. The Majority Report passes lightly over such questions as the possibility of the redistribution of great medical centers

1. The term "public health program" is meant to include the work of the official health departments and of voluntary health agencies.

that have been established in most large cities for educational, political, financial or other purposes which render them ill adjusted to fit into such a program.

It assumes that existing hospital organizations can be so transformed but offers little information as to the methods by which this change may be brought about. There is much talk of "coordination and control of services" but there is no definite statement as to what is to constitute this important factor in the program.

Chapter four considers "Plans and Experiments Now Under Way" and lists twenty-five such experiments. Four of these are "under professional sponsorship"; four "under consumer sponsorship"; thirteen are listed as "under community sponsorship with professional participation"; one "under joint sponsorship of professional and consumer groups," and three "under commercial sponsorship." All of these are treated without the specific criticisms necessary to inspection of the foundation stones on which the structure of the national medical service is to be erected.

The committee concludes that:

"These twenty-five types of development in the United States and the many developments abroad show a ferment at work in medical practice which contains great possibilities for good and evil. The Committee is aware of the fact that some of the plans are mere attempts to capitalize for private gain the people's need for better medical service. It is equally aware of the dangers inherent in other plans. Each should be viewed as an experiment and subjected to the careful evaluation that is given in a scientific laboratory. Some of them appear to the Committee to be very promising."

The fifth chapter includes "The Recommendations of the Committee" previously here quoted. The somewhat vague character of the report is excused by the statement that "the Committee believes that its obligations require it to think ahead for twenty or thirty years, as well as for the next five or ten years and to present distant as well as immediate goals."

The Committee's first recommendation that medical service "should be furnished largely by organized groups of physicians, dentists" and so on does not take account of the fact that these groups are already professionally organized in their own associations. Indeed, the existence of these professional associations is almost entirely ignored in the Majority Report.

"The Committee's most fundamental specific proposal is the development of suitable hospitals into comprehensive community medical centers."

Industrial medical service is cited as another step toward the realization of this recommendation, and the Majority Report suggests "that free choice of practitioners should be allowed insofar as practicable."

University medical service is also to be fitted into this scheme. "In 'College towns' it may frequently be feasible to expand the university medical service into a community medical center which serves townspeople as well as students."

The Majority Report recognizes the necessity of measures to maintain the quality of medical service in groups; no recommendations are made concerning relationships with professional associations, the most important bodies for maintaining standards.

The recommendation which will undoubtedly attract the most attention is that "the costs of medical care be placed on a group payment basis, through the use of insurance." The discussion is extremely indefinite. The comments interspersed clearly reflect sharp divisions of opinion in the Committee.

It is suggested that "a state medical society might initiate and standardize the

organization of group practice in local areas and serve as a negotiating or mediating body in making the arrangements for group payment." On the whole, however, the Majority Report seems to incline to a voluntary insurance scheme with subsidies from taxation.

There is also the conclusion that making "individual practice and not group practice the logical foundation of the whole system . . . has been one of the chief disadvantages which European countries have faced under compulsory insurance." Examples or evidence in support of this conclusion are not made available.

The Majority Report persistently emphasizes the importance of groups; it looks on insurance "as the most effective possible stimulant to the formation of such groups." It is hard to determine whether the groups are to be the basis or the objective of the program.

Confronted with the problem of the "control of competition," which has hitherto evidently produced deterioration in most of the schemes of contract practice which are discussed, the Majority Report proposes the following devices for its control:

"(*a*) Provision of medical service in increasing proportions by organized nonprofit groups with community backing and control.

"(*b*) State regulation of the finances to assure actuarial soundness.

"(*c*) The formation of general standards and policies, the regulation of charges, and the arbitration of difficulties by the state medical and dental societies or by an officially appointed medical board nominated in large part by the societies."

The Majority Report urges a study by professional groups with lay participants as a preliminary to the installation of any program.

In the final chapter, "The Challenge of the Future," appears recognition of the place of such professional associations. The report says:

"The cooperation of the professional groups in community or state leadership is essential. Their stake in these issues is very large; their interest is continuing. They should instigate as well as guide. The crucial point in the generalship of the forces at work is, perhaps, the development of a proper relation between the professional and the lay groups. The public should recognize the central place of the professional groups in determining standards and methods. The professions should recognize their ultimate responsibilities to the public. The control of undesirable commercial enterprises in this field will depend largely on the watchfulness of the professional bodies, on their ability to enlist lay cooperation, and on the development of sound and successfully operating non-commercial plans.

"Continued study of the complex problems of medical economics is of the first importance. The Committee's investigations have opened a way. Fortunately, professional societies are establishing bureaus and committees on medical economics. Because a university has the unique advantage of having both medical and social scientists in one organization, the Committee has formally recommended to the universities of the country that they conduct research in this field."

Minority Reports

Two minority reports and two statements constitute the views of those members of the committee who found themselves in conflict with the general tone or trend of the majority report.

First Minority Report

The first minority report, which was signed by A. C. Christie, M.D., George E. Follansbee, M.D., M. L. Harris, M.D., Kirby S. Howlett, M.D., A. C. Morgan, M.D., Alphonse M. Schwitalla, Ph.D., N. B. Van Etten, M.D., Olin West, M.D., and Robert Wilson, M.D., draws attention to the failure of the Committee to show by facts that

"organization" can accomplish what is claimed for it in the majority report. There is nothing in the experience of the medical profession to show that the "Community Medical Center" is a workable scheme or that it would not contain evils of its own which might be worse than the evils it is supposed to alleviate. This Medical Center Plan is suggestive of the great mergers in industry in which mass production and centralized control are the principal features. It apparently disregards the fundamentals which make medicine a personal service and which require that the individual patient and not diseases or economic classes or groups be the object of medical care.

The objections to the Medical Center Plan are summarized as follows:

1. It would establish a medical hierarchy in every community to dictate who might practice medicine there.

2. It would be impossible to prevent competition among the many such centers necessary for large cities; cost would inevitably be increased by the organization necessary to assign patients to the various centers. This would add to the evils of medical dictatorship those of a new bureau in the local government with its attendant cost.

3. Continuous personal relationship of physician and patient would be difficult if not impossible under such conditions.

In the opinion of this minority group, the question of "Industrial Medical Service" has not been adequately or fairly dealt with in the majority report. For each of the favorable reports published (publications Nos. 5, 18 and 20) many instances could be cited wherein the results of industrial medical services have been exceedingly unfavorable. It is pointed out that in industrial medical services, mutual benefit associations, so-called health and hospital associations, and other forms of contract practice, no means have been found to prevent destructive competition between individuals or groups concerned with these movements. The studies published by the Committee show only the favorable aspects. They were selected because they were considered the most favorable examples of this type of practice in the United States. For each of these plans a score of the opposite kind can be found.

Utilization of subsidiary personnel is nothing new in medical practice. Already there is constant temptation in many fields to permit technicians to perform duties entirely unjustified by their knowledge and training. The minority expresses a word of caution relative to the dangers involved in permitting nonmedical technicians to assume the duties which only physicians should undertake.

The Committee's first recommendation that medical service "should be furnished largely by organized groups of physicians, dentists" and so on is apparently predicated on the Committee's study on "Private Group Clinics." This minority group believes that the establishment of such clinics is in line of progress when they are a natural outgrowth of local conditions, but the studies published by the Committee, in the opinion of the minority, were far too few in number to constitute a safe base on which to erect so large and revolutionary a structure as is proposed. The majority report fails to consider the fact that multiplication of clinics or groups in large communities results in duplication of expensive equipment far beyond the needs of the community. Such a multiplication of medical facilities, instead of reducing overhead and the costs of medical care to the community, adds to this cost through the duplication of plants. It is significant to note that the overhead in private medical practice

averages only about 2 per cent higher than for medical groups in the lower brackets of gross income. As the gross income rises, the ratio of overhead becomes progressively less significant.

Other disadvantages of group practice are: restriction of freedom of action in respect to vacations, study, travel, attendance on scientific meetings and even publication of medical articles to all members except the heads of the group; comparatively static income of members of a group except that of the owner or owners; salary cuts, then discharge of employees to reduce overhead in times of depression; disruption of groups through death or disability of some able man or men around whom the group has been built, and the difficulty with which physicians are able to find employment in another group or are able to enter private practice when a group closes.

In spite of the extensive data available on the insurance systems of Europe and the evidence which can be produced to show that voluntary health insurance schemes have everywhere failed, the majority of the Committee makes the definite recommendation that this country adopt the thoroughly discredited method of voluntary insurance. A system of voluntary health insurance tied to the visionary medical center plan, which is offered as the "keystone" of all medical service, would plunge the medical profession into similar or more difficult problems than have been experienced by the European professions in its struggle against the various European insurance schemes. In the United States, contract practice is essentially health insurance and has already given rise to destructive competition among professional groups, inferior medical service, loss of personal relationship of patient and physician, and demoralization of the profession. It is clear that all such schemes are contrary to sound public policy and that the shortest road to commercialism of the practice of medicine is through the supposedly rosy path of insurance.

The objections to compulsory health insurance are almost as compelling to this minority group as are those to voluntary insurance. Proof of the evils of the compulsory system is at hand in our own experience in this country with the only compulsory system with which we have yet had to deal, workmen's compensation insurance. Under workmen's compensation, groups are soliciting contracts, often through paid lay promoters; laymen are organizing clinics and hiring doctors to do the work; standards of practice are being lowered; able physicians outside the groups are being pushed to the wall; the patient is forced by his employer to go to a certain clinic, and the physician is largely under the control of the insurance companies. These are not visionary fears of what may happen but a true picture of widespread evils attending insurance practice. No better example should be needed of what must happen to medical care if compulsory insurance is extended to families.

The total cost of medical care is usually increased when it is paid for through insurance, because the cost of operation of the insurance plan must be added to the cost of medical care and the number of persons sick and the number of days' sickness per capita always increase under any insurance system. The Majority Report registers approval of insurance but disapproves of insurance companies. The minority group agrees with the principle that, in any contract practice plan involving an insurance principle, this principle should be applied through a nonprofit organization. The minority group has not attempted to marshal all the facts or arguments that can be used against health insurance but

has endeavored to show that there are great dangers and evils in insurance practice which must be set over against the advantages of distributing the costs of medical care by this method. The minority group believes that the majority report has minimized these dangers and evils.

The minority recommendations follow:

"I. The minority recommends that government competition in the practice of medicine be discontinued and that its activities be restricted (*a*) to the care of the indigent and those patients with diseases which can be cared for only in governmental institutions; (*b*) to the promotion of public health; (*c*) to the support of the medical departments of the Army and Navy, Coast and Geodetic Survey, and other government services which cannot because of their nature or location be served by the general medical profession; and (*d*) to the care of veterans suffering from bona fide service-connected disabilities and diseases, except in the case of tuberculosis and nervous and mental diseases.

"II. The minority recommends that government care of the indigent be expanded with the ultimate object of relieving the medical profession of this burden.

"III. The minority joins with the Committee in recommending that the study, evaluation and coordination of medical service be considered important functions for every state and local community, that agencies be formed to exercise these functions, and that the coordination of rural with urban services receive special attention.

"IV. The minority recommends that united attempts be made to restore the general practitioner to the central place in medical practice.

"V. The minority recommends that the corporate practice of medicine, financed through intermediary agencies, be vigorously and persistently opposed as being economically wasteful, inimical to a continued and sustained high quality of medical care, or unfair exploitation of the medical profession.

"VI. The minority recommends that methods be given careful trial which can rightly be fitted into our present institutions and agencies without interfering with the fundamentals of medical practice.

"VII.. The minority recommends the development by state or county medical societies of plans for medical care."

SAFEGUARDS IN DISTRIBUTION OF MEDICAL COSTS

This minority group agrees that any plan for the distribution of medical costs must have the following safeguards:

1. It must be under the control of the medical profession. (A "Grievance Board" to settle disputes, having lay representation, is permissible and desirable.)
2. It must guarantee not only nominal but actual free choice of physician.
3. It must include all, or a large majority of, the members of the county medical society.
4. The funds must be administered on a nonprofit basis.
5. It should provide for direct payment by the patient of a certain minimum amount, the common fund providing only that portion beyond the patient's means.
6. It should make adequate provision for community care of the indigent.
7. It must be entirely separate from any plan providing for cash benefits.

COUNTY SOCIETY PLANS FOR MEDICAL CARE

The minority group states its reasons for favoring thorough trial of the county

society plan for furnishing complete medical care as follows:

1. It places responsibility for the medical care of the entire community on the organized physicians of the community.

2. It places medical care under the control of the organized profession instead of in the hands of lay corporations, insurance companies, and so on.

3. It places responsibility for the quality of service directly on the organized profession. It is in fact the only plan that guarantees quality of service and makes it the only basis of competition.

4. It removes the possibility of unethical competition because it includes all the physicians of the community and fixes a fee schedule.

5. Solicitation of patients, underbidding for contracts and other evils of the usual insurance plans are eliminated.

6. Freedom of choice of physician is assured and the essential personal relationship of physician and patient is thereby preserved.

7. It is the only plan that includes all classes, from the indigent to the wealthy.

8. It is adaptable to every locality, both urban and rural.

9. It provides for a minimum cost of administration by operating on a nonprofit basis.

10. It provides for payment, by every patient with income, of a certain minimum amount before the insurance is in operation. The minimum rises with the patient's income. This provision alone will operate to avoid many abuses in all other types of insurance practice.

11. It provides for means of certification of disability separate from the attending physician.

12. Cash benefits do not form a part of the plan.

SECOND MINORITY REPORT

[The summary of the Second Minority Report is omitted, this report being published in full elsewhere in this issue.]

The Committee on the Costs of Medical Care*

This week the Committee on the Costs of Medical Care completed its five year study and made available a final report. An abstract and analysis of the report appears under Medical Economics in this issue of *The Journal*. The recommendations of the majority of the committee will not come as a surprise to the thousands of physicians who have followed closely the trend of the studies as indicated by the reports published from time to time since 1927. The director of the work, Harry H. Moore, Ph.D., published a book called "American Medicine and the People's Health," which revealed his personal bias for insurance schemes and, indeed, for governmental practice. So definite was the trend of the committee's studies in this direction that one must view the expenditure of almost a million dollars by the committee and its final report with mingled amusement and regret. A colored boy spent a dollar taking twenty rides on the merry-go-round. When he got off, his old mammy said: "Boy, you spent yo' money but where you been?"

Knowing the composition of the committee, physicians will not be surprised that a significant minority dissented from the majority report. True, the majority included seventeen men with the degree M.D., of whom seven are listed as in private practice and the others as public health officials or representatives of institutions or special interests. The minority report, however, is supported by Dr. Olin West, secretary of the American Medical Association; George E. Follansbee, the chairman of the Judicial Council; M. L. Harris, a former President and for many years a member of the Judicial Council, and also Drs. A. C. Christie, Kirby S. Howlett, A. C. Morgan, Robert Wilson and N. B. Van Etten, and Alphonse M. Schwitalla, Ph.D. Moreover, two representatives of American dentistry, Drs. Herbert E. Phillips and C. E. Rudolph, dissent in a separate minority report.

*Editorial comment.

Briefly, the majority report recommends that medical practice be rendered largely by organized groups associated with hospitals, and it expresses the hope that these groups will maintain the personal relationship between patient and physician so essential to good medical care. The rendering of all medical care by groups or guilds or medical soviets has been one of the pet schemes of E. A. Filene, who probably was chiefly responsible for establishing the Committee on the Costs of Medical Care and in developing funds for its promotion. Such practice has, moreover, on various occasions had the endorsement of representatives of some of the eight foundations that contributed financial support. In contrast with this recommendation of the majority report, the minority bluntly recommends that "united attempts be made to restore the general practitioner to the central place in medical practice." This it does with good reason, for experience has shown that more than 80 per cent of all the ailments for which people seek medical aid can be treated most cheaply and most satisfactorily by a family physician with what he can carry in a handbag. All of the expensive studies and investigations carried out by the Committee on the Costs of Medical Care have not disproved this fact. In elaborating its recommendations, the majority report also endorsed industrial practice involving those schemes in which corporations care for employees and their families, as well as expansion of student health services at universities, so that these may serve faculty and townspeople as well as students. Most of the university services studied by the committee are in large cities where such an expansion is manifestly impossible. *The Journal* has pointed out repeatedly that such practices will mean the destruction of private practice; that they represent exploitation of physicians for the gain of business; that they put medical schools into unfair competition with their own graduates, and that they are, in a word, "unethical." Knowing the composition of the Committee on the Costs of Medical Care, it is interesting to find the pet plans of many of its members so sweetly elaborated in the majority report.

Both the majority report and the chief minority report are concerned with public health services. The majority report recommends extension of all basic public health services to make them available to more and more people. The minority report views with alarm further invasion of governmental agencies into the practice of medicine. And what a curse such invasion has been! Who today fails to realize the menace inherent in the expansion of the Veterans' Bureau? Even most radical health officials, moreover, are finding that their best policy will be to give medical practice back to the medical profession.

The minority report does recommend that the care of the indigent by the government be expanded with the ultimate object of relieving the medical profession of this burden. Already some county medical societies have worked out cooperative plans with their communities which seem to work practically in this direction. To what extent such plans may lead toward state medicine is, of course, problematic. Certainly physicians who are paid for the care of the indigent will be able to lessen fees for those able to pay only part of a usual medical fee.

The real question for consideration is the problem of providing funds for the care of the 10 to 20 per cent of serious medical and surgical conditions for which wage earners usually find themselves poorly, if at all, prepared. The majority report would place medical costs on a group payment basis through insurance, taxation or both but without abolishing practice on an individual fee basis for those who prefer it. Profiting by the experience of foreign countries, it is recommended that health insurance be distinctly separated from unemployment insurance or insurance against loss of wages. On the contrary, the minority report says flatly:

"It seems clear that recommendations for further trial and expansion of voluntary insurance schemes in the United States are entirely inconsistent with the Committee's own findings. To recommend that our own country again experiment with discredited methods of voluntary insurance is simply to ignore all that has been learned by costly experience in many other countries as well as our own.

"Voluntary insurance schemes are now in operation in many parts of the United States and are increasing in number and in size. In many places these schemes are being operated in accordance with the plan recommended by the majority of the Committee, that is, by making contracts with organized

groups of the medical profession. That they are giving rise to all the evils inherent in contract practice is well known. Wherever they are established there is solicitation of patients, destructive competition among professional groups, inferior medical service, loss of personal relationship of patient and physician, and demoralization of the profession. It is clear that all such schemes are contrary to sound public policy and that the shortest road to the commercialization of the practice of medicine is through the supposedly rosy path of insurance."

This need not be taken to mean that the minority report is opposed to any individual carrying insurance against the occurrence of a major illness or operation so that he might receive at such time funds sufficient to pay the hospital and the physician he might select. No doubt, insurance companies could sell such policies most reasonably if a sufficient number of persons could be induced to insure themselves and their families in this manner. Such a procedure is foresighted, American, economical. It preserves personal relationship and the free choice of physician and hospital; moreover, it makes the patient responsible to the physician and places squarely on the physician the responsibility for the care of the patient.

Both the majority and minority reports recommend continued study of medical economic problems by every type of agency. Certainly the studies already published by the committee indicate the value of such studies and the necessity for having facts on which to base conclusions and recommendations. This would seem to be particularly true in relationship to such studies as are available of various industrial medical services and of corporate practice. The minority report is particularly resentful that the majority made recommendations on the basis of inadequate studies in this field. Thus it says:

"It is the belief of the minority group that the majority report has presented this question in a distorted manner. The evils of contract practice are widespread and pernicious. The studies published by the Committee show only the favorable aspects. They were selected because they were considered the most favorable examples of this type of practice in the United States. For each of these plans a score of the opposite kind can be found. The evils are inherent in the system although they may be minimized when a high grade personnel is found either among employees or medical group, or both."

Specifically, the recommendation of the minority group reads:

"The minority recommends that the corporate practice of medicine, financed through intermediary agencies, be vigorously and persistently opposed as being economically wasteful, inimical to a continued and sustained quality of medical care, or unfair exploitation of the medical profession."

These two reports represent, therefore, the difference between incitement to revolution and a desire for gradual evolution based on analysis and study. The majority report urges reorganization of medical practice, the development of centers, insurance; if necessary taxation to provide funds; expansion of public health services. The minority is willing to test any plan that may be offered if it conforms to the medical conception of what is known to be good medical practice. Indeed, the minority recommends "that methods be given careful trial which can rightly be fitted into our present institutions and agencies without interfering with the fundamentals of medical practice." One seems to hear that famous medical aphorism that has come down through the centuries: "Prove all things; hold fast to that which is good."

In addition to the majority report and the first minority report, several others by smaller groups appear in the final report. The dental members, as previously mentioned, oppose the plan for centers as utopian. They favor some form of compulsory health insurance under professional control. Dr. Edgar Sydenstricker would not sign because he felt that the recommendations did not deal with the fundamental economic problem the committee was formed to consider. If by this he meant that the problems of the wage earner and of the poor include the provision of food, fuel, housing, clothing and transportation as well as medical service, he will find most of the world in agreement with him.

Early in the majority report it is emphasized that low incomes are largely responsible for the problems which the committee was created to investigate, but that subject is apparently never mentioned again in the majority report.

In September the Board of Trustees and the Judicial Council of the American Medical Association met with a group of physicians

representing various portions of the country to hear an analysis of economic problems. Last week the Board of Trustees met with the secretaries of state medical societies and with the editors of the state medical journals. At this meeting, Dr. William Allen Pusey, speaking for a committee appointed at the previous session, presented an analysis of the principles on which medicine must stand, its responsibilities to the public, and the return it has a right to expect from that public. In the twelve points under which he assembled his conclusions, several are especially significant in relation to the final report of the Committee on the Costs of Medical Care. They are briefly:

"The good of society must be the sole aim of its public policies and the good of the patient the first consideration in the relations between physicians and patients.

"Experience has shown that the vast majority of disease conditions afflicting man can be most satisfactorily and economically diagnosed and treated by a competent individual general practitioner.

"Medicine's chief concern must be for the individual physician; the service rendered by individual physicians in the aggregate constitutes the great bulk of medical service. The quality of service which is given depends on the competency of the individual physicians who give it.

"The medical profession asks a career of independence under conditions of free and dignified competition.

"In its ideals of independence, medicine has a right to control its own affairs. Its history of capacity to do so and altruism justifies this claim."

The Journal, under the auspices of the Board of Trustees, representative of organized medicine in this country, urges physicians to familiarize themselves with the abstract of the final report of the Committee on the Costs of Medical Care which appears in this issue, if not with the complete report. It urges, after careful consideration, support of the minority report signed by the representatives of the American Medical Association in the committee. The alinement is clear—on the one side the forces representing the great foundations, public health officialdom, social theory—even socialism and communism—inciting to revolution; on the other side, the organized medical profession of this country urging an orderly evolution guided by controlled experimentation which will observe the principles that have been found through the centuries to be necessary to the sound practice of medicine. On the one side are alined the forces that would practice one kind of medicine for the rich, another for the wage earner and the indigent; on the other side are the physicians who know that, from the point of view of the physician who studies bodies and minds, all are human beings. The physicians of this country must not be misled by utopian fantasies of a form of medical practice which would equalize all physicians by placing them in groups under one administration. The public will find to its cost, as it has elsewhere, that such schemes do not answer that hidden desire in each human breast for human kindliness, human forbearance and human understanding. It is better for the American people that most of their illnesses be treated by their own doctors rather than by industries, corporations or clinics. The American Medical Association, through its Board of Trustees, supports the minority report. No doubt the House of Delegates, at its session in Milwaukee next June, will urge every physician affiliated with the Association to do likewise. —*J. A. M. A.,* Dec. 3, 1932.

MINORITY REPORT NUMBER TWO*

THE undersigned are in accord with the main position of the majority of the Committee, in that we recognize existing professional and social trends in medical care as brought out by the Committee's studies and believe that these trends necessitate substantial changes in the manner in which medical service is rendered and paid for. There is no doubt in our minds that an increased amount of medical service should and will be rendered through professional organizations rather than by individual practitioners working independently. We also believe that payment for medical service by distributing the costs over groups rather than having it fall upon individuals is a sound principle when applied in such ways as maintain professional standards of service. We are in accord, therefore, with the general recommendations of the majority in favor of group practice and group payment, although we must register dissent from certain specific proposals and certain implications of the majority report which we do not consider justified.

We are, however, in accord with those who signed Minority Report No. 1 in strongly emphasizing the necessity of maintaining professional standards and the position of the general practitioner, and we recognize, as they do, that grave dangers to these standards have developed in the past and will exist particularly during a period of rapid changes in medical service such as we are undoubtedly facing. In our opinion, the most important influence for the maintenance of professional standards is vigorous initiative on the part of the professions themselves. They should, as individuals, and through their professional organizations, recognize frankly the existence of the problems and needs which are brought out by the studies of this Committee and should themselves take steps to deal with them, through initiating or participating in experiments in group practice and group payment. We realize that needs are more acute in some localities than in others and therefore early recognition of these needs should be made. Nothing, in our opinion, would be more detrimental not only to the medical service of the public, but to the welfare of the professions, than an attitude of opposition or mere aloofness on the part of the professions. We recognize that certain evils that have developed in group practice and in sickness insurance in the past have been chiefly due to lack of professional initiative and control and that with the assumption of initiative and control by the professions at this time these evils will be minimized in the future.

We feel with those signing Minority Report No. 1 that the attitude of the majority is unduly critical of the professions, and that this attitude has developed a bias in some of the statements in their report. We agree also that the investigation of industrial schemes by the Committee almost entirely over-

*From the Report of the Committee on the Costs of Medical Care.

looked their defects, and only the least objectionable and most successful were chosen for study.

We agree with Minority Report No. 1 that the description of the community medical center, which is set forth in the third chapter of the Majority Report as the ultimate goal of development, is Utopian in concept, and involves many details which are too visionary or problematical to justify inclusion in an authoritative report of this kind.

It is to be regretted that the Committee's studies did not include any study of dental group practice. Studies of such groups should have been made both as regards their organization and the quality of their service. The dental profession should initiate experimentation in dental group practice and should encourage cooperative experiments involving physicians and hospital service. Studies of the American Dental Association show that such cooperative participation is on the increase. All such experiments would provide valuable facts as a basis for future development.

We do not consider that voluntary and compulsory sickness insurance should be regarded as in opposition to each other or as unrelated proposals, as seems to be implied in the Majority Report. European experience indicates that methods developed under voluntary insurance have indicated the pattern for compulsory insurance later, and should furnish necessary experience for the United States. Experience thus gained in voluntary insurance, both by the public and the professions, would be an asset if and when certain states contemplate compulsory systems. In certain sections of the United States, voluntary insurance has already developed to a considerable degree. It is true that in these sections certain evils have developed but it is probable that the introduction of compulsory insurance under professional control will eliminate the objectional features. The more the difficulties are eliminated or controlled in the voluntary plan, the less risk of having objectionable features in the subsequent compulsory insurance.

We do not feel that this method of payment need interfere with the highest professional standards nor with the close personal relationship between practitioner and patient.

The studies of the Committee indicate that a large proportion of the population receive incomes, even during prosperous times, so low as to preclude the purchase, under any form of payment, of adequate medical service. This is emphasized by the following quotation from Summary Volume, Chapter XXXIV:

> The significance of the economic barrier between the true need and the current receipt of medical care is especially evidenced by the finding that far greater inadequacies obtain for those of small than those of large means. Just as some people go hungry though the country produces more food than the people can consume; many are inadequately clothed though we manufacture more clothing than we can use; even so millions are sick, hundreds of thousands suffer pain and anguish, and tens of thousands die prematurely for lack of medical care which available personnel and facilities could supply. The tragedy concealed in this conclusion is the more poignant because medical practitioners and institutions are used to only part of their capacity—not because their services are not needed, nor because they are unwilling to serve.

We add to these reasons because fundamentally, as the studies of the committee reveal, the problem of providing medical care is a question of low incomes and the solution depends at least as much upon increasing incomes to a satisfactory standard of living, as upon methods of organizing medical care. We recognize,

however, that the ability to purchase medical care on an insurance basis is greater than when the cost falls upon the individual family.

We are in accord with and strongly recommend medical society plans of sickness insurance such as those referred to in Minority Report No. 1, page 179. These would place responsibility on the professions for the maintenance of standards of service and would set up, for a state or a community, agreed rates of payment so that competition between different professional groups furnishing service or between individual practitioners would be on a basis of quality of care and not on a basis of charges. It is destructive to standards of medical care, in which both the public and the professions have a common interest, if competition exists in such form as to bring about price-cutting and underbidding for service. We strongly endorse the initiative of such professional bodies as the Milwaukee Medical Society* or the State Medical Society of California in endeavoring to meet their obligations to the public by developing plans of group payment. Such a form of organization of medical service under professional control will set a pattern which will determine the direction of any future development of organized medical care in voluntary or compulsory insurance. Such an opportunity typifies the attitude of the British Medical Association referred to in the quotation on page 118 of the majority report as follows:

> Such a scheme may be compared to a plan submitted by an architect to a householder who wants to extend the house in which he lives, and to introduce all modern improvements. The householder may, on seeing the plan, decide that it would cost too much and that he must put up with his house as it is; or he may make suggestions for the modification of the plan. But the householder knows that if he wants to extend his house he is, as regards essentials, in the hands of the architects and builders.

We fully agree with the statement concerning coordination of medical service contained in Minority Report No. 1, page 172, as quoted from the Committee's report, page 134.

With a full knowledge of the inherent evils of the early competitive systems of medical and dental education, we believe it would be of great value if a national organization were to be formed to study group practice and to define its standards, and suggest that such a plan be sponsored by those bodies that have supported studies of medical and dental education.

During rapid social changes group practice and individual practice are developing side by side, and should develop in cooperation. Conflicts between those dealing in medical care under any auspices will have a disturbing effect on practitioners and a detrimental effect on the public, whom they serve. All of this is against professional traditions of medical care. These methods must meet in service, adjustment must be made so that conflicts may be eliminated, and codes must be adapted to meet changing conditions.

HERBERT E. PHILLIPS,
C. E. RUDOLPH.

*See p. 75 of the Committee's report for a description of the Milwaukee plan.

CRISTOBALITE FOR DENTAL INVESTMENT*

By WILLIAM T. SWEENEY, A.B.,† Washington, D. C.

THE properties of dental investments are of great importance to the dental profession and have received considerable attention in the cooperative research between the Bureau of Standards and the American Dental Association.

The usual types of inlay investment consist of refractory mixtures of some form of silica, usually quartz, and plaster of Paris in varying proportions together with small additions of modifying materials to control the setting time, color, etc.

Silica (SiO_2, silicon dioxid) is one of the most abundant constituents of the earth's crust. There are several crystalline forms of silica, which have different temperature ranges of stability. These are called quartz, tridymite, cristobalite and fused silica. Inversion from one of these forms to another takes place slowly. Table 1, in part from Sosman,[1] shows the inversions that are possible when silica is heated at different temperatures. There are, moreover, two or more forms of quartz, tridymite and cristobalite. Inversion from one of these to another takes place rapidly. It is the inversion from the low temperature to the high temperature form of cristobalite which makes the materials considered in this paper of value as the refractory ingredients of dental investments.

A previous article[2] thoroughly covered the commercial inlay investments available to the profession at that time. It also mentioned a new type of investment in which cristobalite was substituted for quartz. This investment was developed[3] at the Bureau in an effort to produce an inlay investment which had sufficient thermal expansion to compensate for the casting shrinkage of the gold. Cristobalite was produced by heating powdered fused quartz scrap.

PATENT SITUATION

It was subsequently discovered that a patent had been applied for by others for essentially the same investment. With their consent, the application was examined at the Patent Office by two members of the Bureau's staff, who recommended that the application by the Bureau and the American Dental Association should not be filed as the other parties had undisputed priority.

*Publication approved by the acting director of the Bureau of Standards of the U. S. Department of Commerce.

*Read before the Section on Partial Denture Prosthesis at the Seventy-Fourth Annual Session of the American Dental Association, Buffalo, N. Y., Sept. 14, 1932.

†Junior Scientist, Bureau of Standards.

1. Sosman, R. B.: Properties of Silica, New York City: The Chemical Catalogue Co., Inc., p. 60.

2. Taylor, N. O.; Paffenbarger, G. C., and Sweeney, W. T.: Dental Inlay Casting Investments; Physical Properties and Specification, J.A.D.A. 17:2266-2286 (Dec.) 1930.

3. Taylor, N. O.: Progress Report: Research on Dental Materials; Research Program Cooperative Work on Inlay Casting Technic, J.A.D.A., 18:298 (Feb.) 1931.

CLINICAL RESULTS

Many members of the cooperative committee of dentists throughout the country were very much interested in this new type of investment and were supplied with small quantities for experimental purposes. They found that it gave more satisfactory results than the ordinary commercial investment.

ECONOMICAL PRODUCTION

Since this experimental lot of cristobalite was produced from fused quartz, a relatively expensive raw material, it was deemed advisable to investigate the production of cristobalite from quartz (sand).

Since it was realized that quartz is probably the cheapest raw material available, most of the effect was focused on developing a suitable method for converting quartz to cristobalite.

Determinations were also made of the relative amounts of the forms of silica necessary to produce an investment having the desired physical properties. While the project is by no means worked out in detail, material was developed which, when made into an investment, gives enough expansion to compensate completely for the casting shrinkage of the gold. The following results are reported in the hope that they may contribute something to the improvement of dental investments now being used by the dental profession.

TABLE 1.—INVERSIONS POSSIBLE WITH SILICA AT DIFFERENT TEMPERATURES

	Quartz	Tridymite	Cristobalite
Below 870 C.	No change	To quartz	To tridymite To quartz
870 to 1470 C.	To cristobalite To tridymite	No change	To tridymite
1470 C. to melting point	To cristobalite	To cristobalite	No change

TABLE 2.—AVERAGE COEFFICIENTS OF EXPANSION OF CRISTOBALITE (SAMPLE NO. 17)

Temperature Range	Average Coefficient of Expansion per Degree Centigrade			
	First Heating	Second Heating	First Cooling	Second Cooling
	x 10^{-6}	x 10^{-6}	x 10^{-6}	x 10^{-6}
20 to 100 C.	17.8	22.1	23.0	19.3
20 to 200 C.	20.6	23.0	24.6	23.5
300 to 500 C.	7.4	7.2	.....	.....
300 to 700 C.	7.9	6.3	5.7	6.8
20 to 700 C.	20.7	22.0	18.7	18.7

MATERIALS INVESTIGATED

Sixteen samples of material were obtained from the following companies: Charlotte Chemical Laboratories, Inc., Charlotte, N. C.; Consolidated Feldspar Corporation, Trenton, N. J.; General Refractories Company, Baltimore, Md.; Minnesota Mining and Manufacturing Company, St. Paul, Minn.; Ottawa Silica Company, Ottawa, Ill.; and Tamms Silica Company, Chicago, Ill. A few additional samples were obtained

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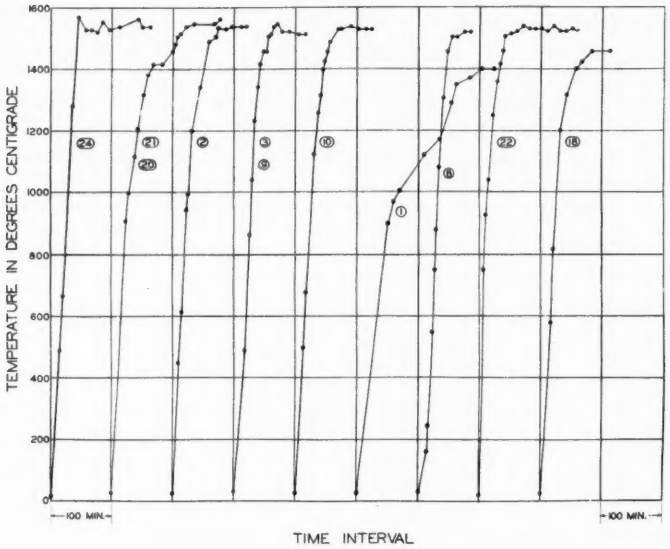

Fig. 1.—Curves showing heat treatment of raw material.

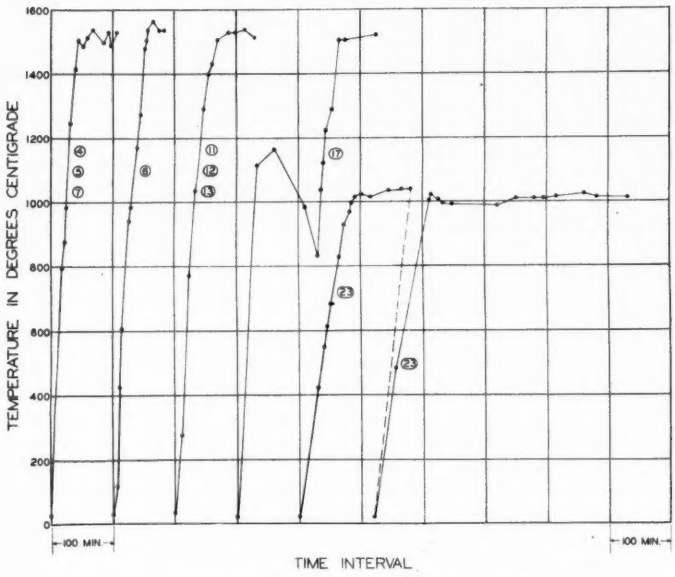

Fig. 2.—Curves showing heat treatment of raw material.

from the laboratories of the Bureau of Standards.

R. B. Sosman,[1] in his book "The Properties of Silica" has collected and classified most of the available data on the subject of cristobalite and the reader is referred to this source for a comprehensive review of the work prior to 1927.

Prior work,[4] as well as an experiment[5] undertaken as a part of this investigation, indicated that the rate of inversion of quartz to cristobalite was affected considerably by the particle size. This is explained by the observation that the change in crystal form takes place from the surface of the particle inward. Hence, an effort was made to have the specimen ground to approximately the same size. All samples would pass a number 100 sieve unless otherwise noted.

The raw material received from the previously mentioned companies was mostly in the form of powdered quartz.

I am greatly indebted to Herbert Insley of the Bureau of Standards staff for the following petrographic examinations:

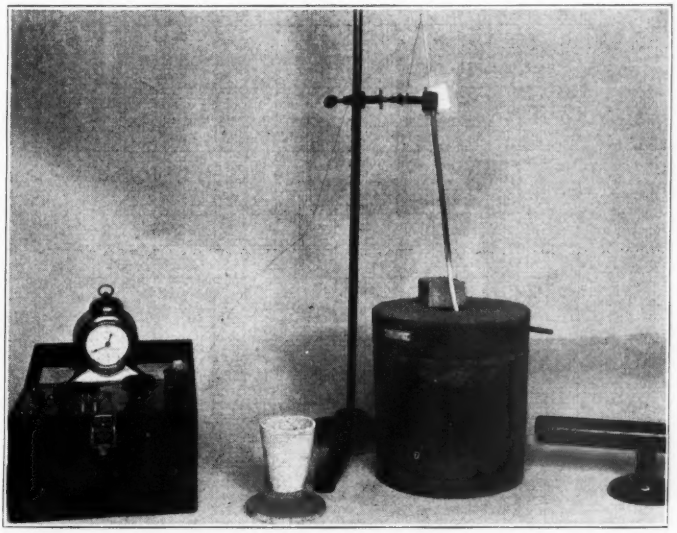

Fig. 3.—Gas furnace and pyrometer.

Sample No. 1. Cryptocrystalline quartz; usually shows spherelitic extinction, very little impurity.

Sample No. 2. Crystalline quartz; contains a very small amount of opaque material.

Sample No. 8. Crystalline quartz; sharp extinction, no twinning, contains a small amount of muscovite and a few dark-colored, isotropic particles (garnet?); considerably coarser grain than previous samples.

Sample No. 9. Crystalline quartz; sharp extinction, no twinning, contains a small amount potash feldspar and a still smaller amount of muscovite.

4. Footnote 1, p. 66.

5. A sample of quartz with all particles approximately 1 mm. in diameter did not convert nearly so much as the same quartz finely powdered, when heated to 1525 ± 25 C. for two hours.

Sample No. 10. A mixture of crystalline and cryptocrystalline quartz; crystalline quartz showing sharp extinction and no twinning; a very small amount of opaque material present.

Sample No. 13. Crystalline quartz; sharp extinction, no twinning; a small amount of impurity including an occasional potash feldspar grain and some unidentified high index mineral; wide range in grain size.

Sample No. 17. Same as No. 1.

Sample No. 18. Burned rice hulls.

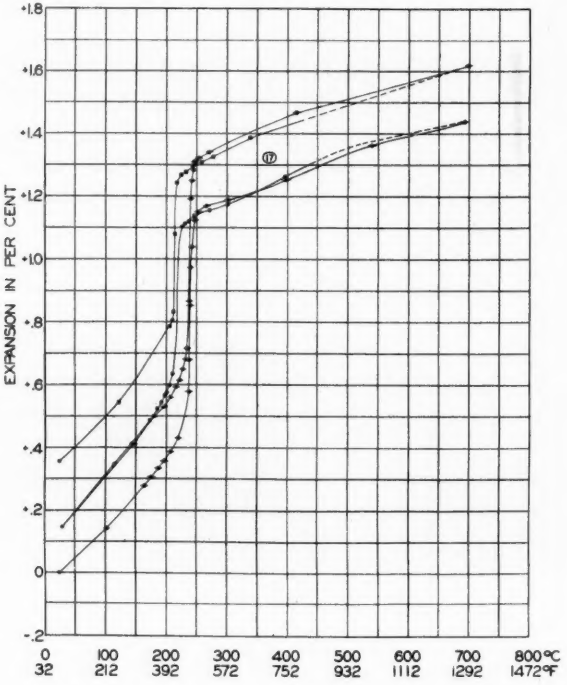

Fig. 4.—Thermal expansion of sample No. 17.

Sample No. 21. Crystalline quartz; very little impurity.

Sample No. 22. Sand grains composed of crystalline quartz; very little impurity.

Sample No. 23. Silicic acid, composed of amorphous material of low but variable index.

Sample No. 24. Composed almost wholly of cryptocrystalline quartz; a few grains of crystalline quartz present.

HEAT TREATMENT

A glance at Table 1 will show that quartz, the common refractory ingredient in investments, will not convert into other forms of silica when subjected to the usual burning out and casting temperatures (400 to 700 C.) which are used in the process of casting dental gold appliances.

It is also apparent from Table 1 that cristobalite is the stable modification of silica above 1470 C. For this reason, most of the attempts to produce the quartz-cristobalite inversions were carried out above this temperature. The heat treatment of all samples is shown in Figures 1 and 2.

The raw materials used in this investigation were heated in a gas muffle furnace. (Fig. 3.) The temperature of the specimen was measured by using a platinum platinum-rhodium thermocouple, covered with a refractory porcelain protection tube.

The electromotive force of the thermocouple was observed with a Leeds and Northrup portable potentiometer. With this equipment, the temperature of the hot junction of the thermocouple was within 10 degrees of the recorded value.

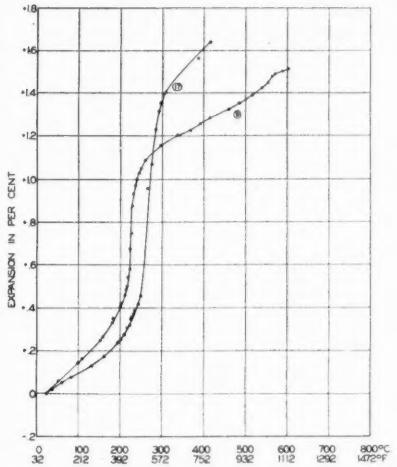

Fig. 5.—Thermal expansion of samples No. 9 and 17.

The powdered specimen was placed in a fire clay crucible approximately 70 mm. in diameter and 90 mm. in height with the junction of the thermocouple in the center of the crucible.

At the end of the heating period, the top of the furnace was removed and the crucible allowed to cool in the air. A sample of each material was examined petrographically after this heat treatment.

Accurate quantitative determinations of the relative amounts of quartz, tridymite and cristobalite could not be made, because of the fineness of grain of the samples, the average size of grain for most of the samples being less than 10 microns. Consequently, the relative quantities were estimated by inspection under the microscope. The different constituents were distinguished by immersing the powdered samples in liquids of known index of refraction. A liquid of index 1.51 was used to distinguish quartz from tridymite and cristobalite, and a liquid of index 1.48 to distinguish cristobalite from tridymite. The figures given

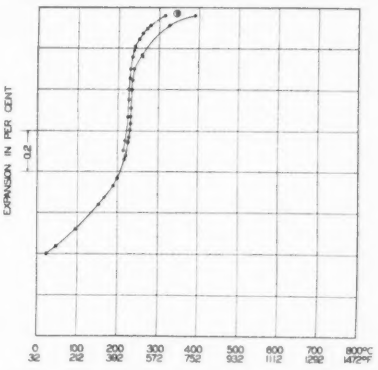

Fig. 6.—Thermal expansion of sample No. 9.

may be in error by as much as ± 10 per cent.

The results are as follows:

No. 1. About 15 per cent quartz, the remainder being largely cristobalite.

No. 2. Largely cristobalite, no quartz; the cristobalite often containing minute, rounded inclusions of a much lower index, possibly air or glass; a fair amount (10-15 per cent?) of an isotropic material with an index somewhat lower (about 1.470) than that of the cristobalite, usually as clear grains, possibly either high temperature cristobalite or a glass.

No. 8. A very small amount of cristobalite, less than 5 per cent; a very small amount of a

dark colored glass probably containing iron; the remainder quartz.

No. 9. No quartz; appears to be composed of about equal amounts of tridymite and cristobalite; a very small amount of a material occurring as minute veins in the tridymite and cristobalite, perhaps a glass.

No. 10. All cristobalite except for a very small amount of a low index material occurring in minute veins.

No. 13. About 5 per cent quartz; the remainder cristobalite except for a small amount of tridymite (5 per cent?).

No. 17. Apparently wholly cristobalite with the exception of minute inclusions which apparently have a much lower index; no tridymite nor quartz discerned.

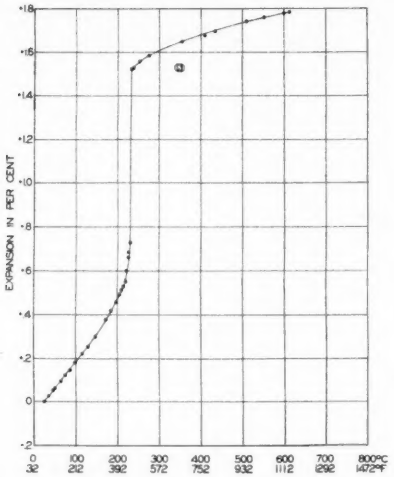

Fig. 7.—Thermal expansion of sample No. 13.

No. 18. About 5 per cent quartz; about 5 per cent of interstitial, high index crystalline material unidentified; the remainder cristobalite.

No. 21. From 25 to 30 per cent quartz, with a very small amount of tridymite; a very small amount of opaque material and a little brown transparent material (iron glass?); the remainder cristobalite.

No. 22. Almost wholly cristobalite; no quartz; no identifiable tridymite; a very small amount of material occurring as tiny veins in the cristobalite, perhaps glass.

No. 23. Almost wholly cristobalite; a very few grains of what appears to be glass; all cristobalite grains filled with minute (1 to 2 micron) globules of low index which may be air.

No. 24. Almost wholly cristobalite; a very little quartz as small remnants (less than 2 per cent); no tridymite; some low index globules (perhaps air) included in the cristobalite.

Twelve additional samples of silicious materials, chiefly quartz, were given approximately the same heat treatment, and the petrographic analysis of these indicated a wide variation in the amount converted to cristobalite. These specimens after heating to from 1500 to 1550 C. for various lengths of time as shown in Figures 1 and 2 contained from 10 to 95 per cent cristobalite, which indicates the importance of the selection of material.

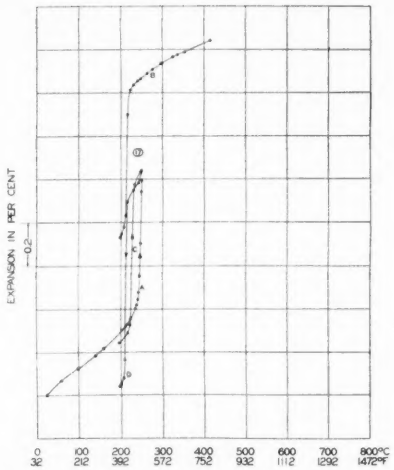

Fig. 8.—Length change of sample No. 17 in the low-high cristobalite inversion range. *A*, first heating; *B*, first cooling; *C*, second heating; *D*, second cooling.

The numbers on the curves for thermal expansion and heat treatment correspond, respectively, to the sample numbers.

THERMAL EXPANSION OF CRISTOBALITE

Thermal expansion of cristobalite obtained from sample number 17, which was as pure as any produced, was determined by the precision expansion equipment[6] and also by the interferometer method.[7]

The expansion sample used in the precision equipment was prepared by mixing the cristobalite with approximately 1 per cent sodium silicate (water glass) as a binder.[8] The specimen was heated to 500 C. and allowed to cool to room temperature, before the expansion test. This produced a specimen with sufficient rigidity and with only a small amount of impurity due to the binder. The specimen was 30 cm. long and of a triangular cross-section about 2 cm. on a side. The specimen was carried through two cycles of heating and cooling between room temperature and 700 C. The observations are shown in Figure 4. Each observation was obtained under conditions approaching temperature equilibrium and, for this reason, the high-low cristobalite inversion for this specimen is accurately defined. The

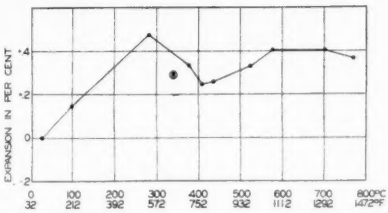

Fig. 9.—Thermal expansion of trial investment (75 per cent sample No. 8; 25 per cent plaster).

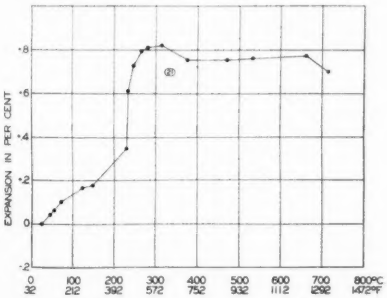

Fig. 10.—Thermal expansion of trial investment (75 per cent sample No. 21; 25 per cent plaster).

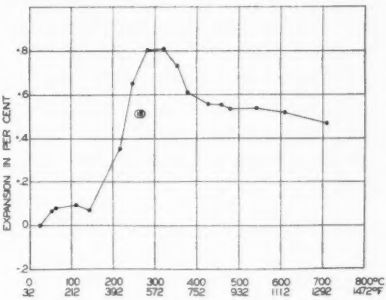

Fig. 11.—Thermal expansion of trial investment (75 per cent sample No. 18; 25 per cent plaster).

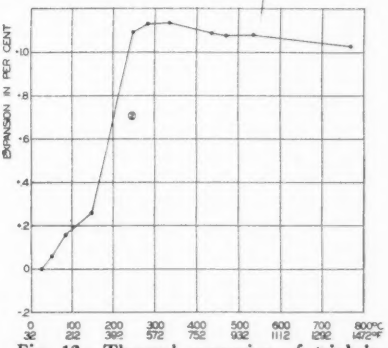

Fig. 12.—Thermal expansion of trial investment (75 per cent sample No. 21; 25 per cent plaster).

6. Souder, Wilmer, and Hidnert, P.: Bur. Stan. Sc. Paper No. 524.

7. Peters and Cragoe, Bur. Stan. Sc. Paper No. 393.

8. Braesco, Paul: Ann. de Physique, 14, 1920. Zwetch and Bucking, Berlin. Deutsch. Keram Ges., 11:262, 1930.

two tests are plotted continuously in order to show the change in length after heating and cooling.

Table 2 gives average coefficients of expansion taken from the curves on heating and cooling.

The expansion of samples No. 17 and No. 9 (Figure 5) were obtained on small specimens of the material after heating. These specimens, which were cut from the lumps of material that sintered together as a result of the heating, were very satisfactory. The observations were made by the use of an interferometer and a portable potentiometer.

It is interesting to note that sample

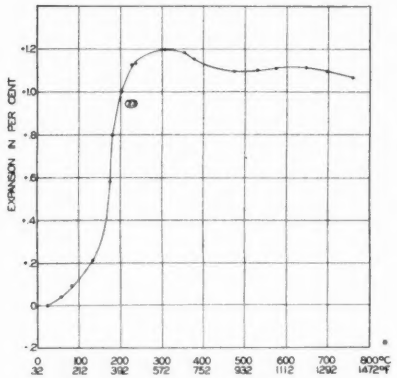

Fig. 13.—Thermal expansion of trial investment (75 per cent sample No. 23; 25 per cent plaster).

No. 9 has less expansion from room temperature to 300 C or higher temperatures than No. 17 for corresponding temperature intervals. This is explained by the fact that No. 17 is practically all cristobalite and No. 9 contains equal parts of tridymite and cristobalite. The second test on sample No. 9 (Fig. 6), using the precision potentiometer and the interferometer method, shows the heating and cooling curve through the inversion range. This gives an indication of the effect of a mixture of these two forms of silica on the expansion and contraction of the mass. Figure 7 shows the expansion of sample No. 13 from room temperature to 600 C. The interferometer specimens were approximately 10 mm. long and the temperature was observed with a portable potentiometer.

INVERSION POINT

The high-low inversion of cristobalite is unlike that of quartz, in having a different inversion temperature when heating than when cooling. There is a relatively large variation in the inversion temperature of cristobalite made

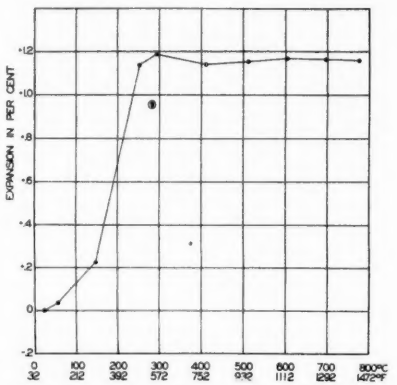

Fig. 14.—Thermal expansion of trial investment (75 per cent sample No. 9; 25 per cent plaster).

from various sources. This appears to be largely controlled by the previous history of the sample.

The values in available literature vary from 175 to 277 C. for rising temperature and from 244 to 175 C. for falling temperature.

Washburn and Navias[9] report accurate determinations on the falling temperature inversion point by observing the

9. Washburn and Navias: J. Am. Ceramic Soc., 5:565-585, 1922.

latent heat. They recorded 220, 227 and 244 C. for calcined chalcedony, flint and purified flint, respectively.

Figure 8 shows the length-temperature relation for two cycles through the inversion range for sample No. 17 using the interferometer method. As the curves are not continuous, the curves are shifted for convenience in plotting the observations.

Table 3 gives data on inversion points of three samples of the prepared material. The length change was determined

In order to have comparable results, all specimens were treated as nearly alike as possible under the circumstances. Each specimen was mixed with a stiff blade spatula and enough water added to give the same consistency, which was approximately the standard consistency used in testing investments against the A.D.A. tentative specification. In order to conserve the material available, quantitative tests on consistency were not carried out, but, from experience with this procedure, it was very prob-

TABLE 3.—INVERSION POINTS

Sample	Method of Measuring		Inversion Point		Length-Change at Inversion Point	
	Length-Change	Temperature	Rising C.	Falling C.	Rising Per Cent	Falling Per Cent
17	Interferometer	Precision-Potentiometer-Thermocouple	246 227	212 210	.... 0.62	0.56 0.74
17	Microscope	Precision-Potentiometer-Thermocouple	239 238	217 216	0.68 0.66	0.52 0.44
9	Interferometer	Precision-Potentiometer-Thermocouple	232	226	....	....
13	Interferometer	Portable Potentiometer	231	...	0.80	....

from the expansion curves. Some difficulty was experienced in locating the exact beginning and end of the inversion.

DENTAL INVESTMENTS

Trial investments consisting of 25 per cent plaster ("hydrocal") and 75 per cent of the burned material of several representative samples were made. The thermal expansion of these investments were measured on the "fused quartz tube" expansion equipment.[10]

10. Hidnert, P., and Sweeney, W. T., Research Paper No. 29, Bur. Stan. J. Res., No. V, 1928.

ably within the allowable limits of the specifications.

The results of these thermal expansion tests are shown in the accompanying figures.

It is interesting to note that sample No. 1 (Fig. 18) expanded more than 1.5 per cent between room temperature and 300 C. (572 F.). In addition to this, the curve is practically horizontal from 300 to 700 C., thereby giving a very wide range for casting while maintaining practically constant dimensions.

The majority of the specimens made from the heated quartz samples had

enough thermal expansion to compensate, practically, for the casting shrinkage of the ordinary dental inlay casting golds. Furthermore, results seem to indicate that by variation of heat treatment and particle size, several more specimens could be sufficiently converted

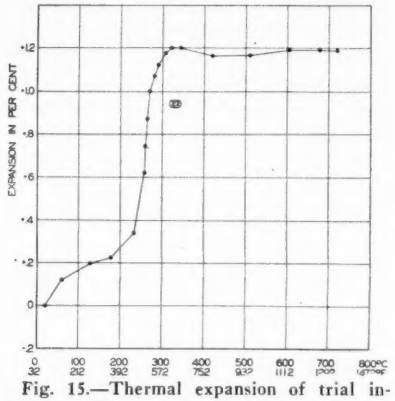

Fig. 15.—Thermal expansion of trial investment (75 per cent sample No. 24; 25 per cent plaster).

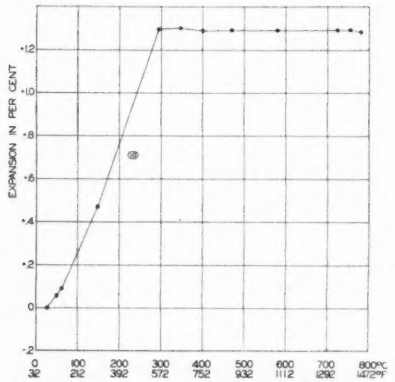

Fig. 16.—Thermal expansion of trial investment (75 per cent sample No. 24; 25 per cent plaster).

to be satisfactory for dental investments.

It is difficult to correlate exactly the expansion of investments with the percentage of quartz, cristobalite and tridymite in the refractory material used in making the experimental investment. This is due in part to the large probable error in the petrographic analysis of such fine grained material, and also due

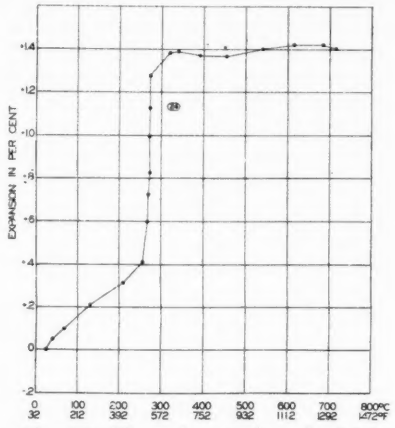

Fig. 17.—Thermal expansion of trial investment (75 per cent sample No. 24; 25 per cent plaster).

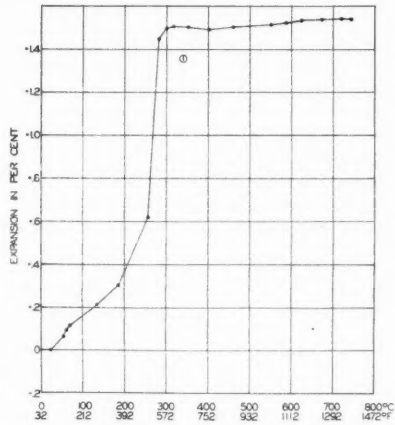

Fig. 18.—Thermal expansion of trial investment (75 per cent sample No. 1; 25 per cent plaster).

to the fact that some of the investments took very much more water to assure

the standard consistency than did others. Sample No. 18 was a very fine grain material before burning. This sample was made from burned rice hulls and, after the addition of the 25 per cent plaster, it required fully 50 per cent more water than the other specimens. This was reflected in a low expansion and a very slow setting, weak investment, although it has a high cristobalite content. (Fig. 11.) By slight modifications, this investment could be greatly improved.

Sample No. 23 (Fig. 13) is very interesting as it indicates what silicic acid[11] will do when heated for a long time (approximately eight hours) at a relatively low temperature (1000 C.).

In my opinion, a satisfactory refractory for dental investments would be one containing 85 per cent or more cristobalite and the remainder quartz or tridymite, preferably tridymite, on account of its higher expansion in the lower temperature range. With this refractory, an investment could be made with sufficient plaster to give high enough expansion and strength, as well as other satisfactory physical properties.

Preparation of cristobalite need not present any serious difficulties provided proper raw materials are selected and these are ground to proper size before heating.

Difficulty will be encountered if large quantities of sand are piled up and heated in mass, as the penetration of heat to the center of the mass will be very slow.

11. Additional data on the expansion of silicic acid after firing at higher temperatures may be found in: Bur. Stan. J. Res., February, 1932, page 231, Research Paper No. 410. (Available at Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents.)

SUMMARY

Samples of quartz and other highly silicious materials were fired under approximately the same conditions. The samples were examined petrographically to determine the degree of inversion of the quartz to cristobalite, and thermal expansion determination was made on the refractory ingredients. Trial investments were made of the material and tested for thermal expansion. Accurate determinations of expansion were made on two samples of fairly pure cristobalite to show the difference in the inversion temperature on heating and cooling. Investments made from refractory materials containing high percentages of cristobalite gave expansion curves which were most suitable for this type of material.

ONE HUNDRED AND EIGHTY-SIX POTENTIAL AREAS ON TOOTH SURFACES WHERE GOLD FOIL MAY BE USED TO REPLACE LOST TOOTH STRUCTURE*

By GUY B. BAIRD, D.D.S., Los Angeles, Calif.

FOR the purpose of study and teaching, the areas and surfaces of the teeth subject to decay have been classified and grouped according to similarity, situation and surfaces of the teeth, each class including cavities requiring similar treatment.

Dr. Black in his "Operative Dentistry," second volume, has designated five classifications or groups of cavities as follows:

Class 1: Cavities beginning in structural defects in teeth; pits and fissures in the occlusal surfaces of the bicuspids and molars, in the occlusal two-thirds of the buccal surfaces of the molars, in the lingual surfaces of the upper incisors, and occasionally in the lingual surfaces of the upper molars.

Class 2: Cavities in the proximal surfaces of the bicuspids and molars.

Class 3: Cavities in the proximal surfaces of the incisors and cuspids which do not involve the removal and restoration of the incisal angle.

Class 4: Cavities in the proximal surfaces of the incisors which do require the removal and restoration of the incisal angle.

Class 5: Cavities in the gingival third—not pit cavities, of the labial, buccal or lingual surfaces of the teeth.

W. Clyde Davis, of the University of Nebraska, in his "Operative Dentistry," has added a Class 6, "abraded surfaces," worn and abraded surfaces on incisal edges and occlusal surfaces of teeth.

Black, page 110 in volume 2, describes a regular "order of procedure in cavity preparation" which is simple, artistic and efficient. If carefully studied and followed, it makes for greater operative skill and develops an accurate technic, resulting in a much better operation, regardless of the material used. Some of the so-called short-cut preparations are not an improvement over the Black preparations as I see it. If the purpose of these preparations is to simplify the operation for the dentist without regard for the welfare of the patient, there is no excuse for their use.

A fundamental law which is coming to be more widely recognized as a basis for the ethics of a successful dental practice is the "Golden Rule": "Do unto others as you would have them do unto you." When we study the classification of the cavities in the teeth, we should have a mental picture that would fix in our minds certain areas of the surfaces of the teeth that might decay, visualizing the treatment or removal of the decay in a cavity preparation according to the specifications of Dr. Black.

In studying the six classifications of cavities and the potential areas where they might occur, we find that, in a full complement of twenty-eight teeth, we

*Read before the Gold Foil Section at the Third Triennial Session of the Pacific Coast Dental Conference, Seattle, Wash., July 8, 1932.

would have 186 cavities as follows: Class 1, thirty-six in pit and fissures; Class 2, thirty-two in the proximal surfaces in bicuspids and molars; Class 3, twenty-four in the proximal surfaces of central and lateral incisors and cuspids; Class 5, forty-two in the gingival third on the labial and buccal surfaces of all teeth, and the lingual, gingival third of all upper teeth, and Class 6, fifty-two cusp points and incisal edges of all teeth; making a total of 186.

We eliminate Class 4 for the reason that these are included in Class 3.

I am speaking of the early stages of decay. There is always a stage wherein the areas are small. They have to grow up large before they can demand a removable bridge or a denture. So we find a great responsibility on our hands to detect them while they are small; in other words to practice "preventive dentistry."

Conservation of tooth structure is becoming more important in the minds of some of our best gold foil operators, Latcham, of Baltimore, Prime, of Omaha, Woodbury, of Council Bluffs, Ferrier, of Seattle, Ruhl and True, of San Francisco, Hollenback, of Los Angeles, and others. In consulting with these men in the last few years, I find they are all more or less of the same opinion; that we should be more conservative in the cutting of tooth structure.

I quote from Black's "Operative Dentistry," volume 2, page 143:

> What extension for prevention does not mean: Extension for prevention does not mean deep cavities in any case. The whole intent is to prevent the beginning of decay in the surfaces of the enamel. It does not have any reference to caries of dentin whatever. The shallowest cavity that will give sufficient stability to a filling answers the requirement.

We have heard a great deal of criticism in the past in regard to Black's teaching of extension for prevention and his wide cutting of tooth structure, and no doubt he may be responsible in a measure for some wrong teaching for the reason that dentists have been studying the illustrations in his textbook and not the text.

Quoting again (page 265):

> Filling cavities with gold by classes, case mesio-occlusal cavity. For the purpose of explaining the principles involved and the technical procedure step by step, a rather broad squarely cut mesio-occlusal cavity has been chosen for the better opportunity of illustration.

This shows that the illustrations depicting wide cuttings were used for the purpose of showing steps in placing a foil filling.

Quoting further (page 145):

> Early discovery of cavities: The discovery of proximal cavities while they are yet very small is more difficult than any other. They are hidden away between the proximal surfaces of the teeth and cannot be seen. Observations of the general practice of dentistry leads to the conclusion that comparatively few of these cavities are discovered and treated so early and yet there is no doubt whatever that this early treatment may be done with much less actual injury to the teeth.

In my opinion, Black's chief idea in his writings and teachings was the conservation of tooth structure.

One of the greatest contributions to dentistry in many years is the bite-wing film by Howard R. Raper and his textbook on roentgenography, "Clinical Preventive Dentistry." By use of the bite-wing film, diseased tooth structure in the interproximal surfaces of the teeth can be detected in its incipiency; which enables the operator to remove and replace the diseased tissue with very little injury to the tooth. There are fifty-six of these interproximal surfaces that require watching, and the dentist who is

not using the bite-wing film is not watching them.

A young woman, aged 20, came to my office a short time ago from another office, saying that she had two small cavities which she would like to have filled with gold. In accordance with our regular routine, she was sent out for bite-wing films, which revealed twenty-two proximal cavities. Several years ago I had three patients come in on the same day, a young woman, aged 22, a youth, aged 19 and a boy, aged 15. I examined their mouths with mirror and explorer and found in all twelve cavities. I had bite-wing films taken of each mouth and sixty-one cavities were revealed, a difference of forty-nine cavities in three patients. This was enough to convince me that every young person that has the teeth examined should have bite-wing films taken, as it is impossible to find these Class 2 cavities in any other way in the initial stage. Their early detection enables the operator to remove and replace the decayed structure with little injury to the tooth. This has more or less required a little different technic as the preparation becomes a more delicate operation. Finer instruments are required and the cavity is smaller, but the order of procedure is the same as with a different approach to the decayed portion. I use a knife-edge stone to cut through the enamel just inside and into the marginal ridge, being careful not to cut the adjacent tooth. Then, with a small round bur I cut through the groove made with a stone into the decayed area, then cut through the enamel to the adjacent tooth and follow the groove made by the stone through to the depth and length of the step. The enamel of the marginal ridge is chipped away with a Wedelstaedt chisel by a blow from the mallet held by the assistant, which opens the cavity so the operator may visualize just what he wishes to do. Instruments used from this point on would be an inverted cone bur, Wedelstaedt chisels and angle formers. I find many men are not familiar with the angle former, which is indispensable in cutting line angles and point angles, so necessary to cavity preparation in foil restorations. These instruments first came to my attention through the Woodbury-Crandall set.

Speaking of the conservation of tooth structure, I believe that there are more failures from faulty replacement than from lack of extension for prevention. (This is my personal opinion after thirty years of observation.)

To refer to Dr. Davis' classification, Class 6, "worn and abraded areas on the occlusal surfaces of biscuspid and molars, occurring mostly on the cusp points and incisal edges of the anterior teeth": Davis saw the need of this classification in teaching students, but does not emphasize its treatment to any great extent. He does advise the use of platinized foil as a replacement material in its treatment.

Prime, a few years later, called attention to the need of caring for these worn places in their beginning as a protection to the occluding surfaces, preventing rapid wear and the breaking down of the enamel rods. He cuts into the dentin with a small round bur, flattening the base with an inverted cone bur and beveling the margins with a stone or large round bur. The filling will look like a small tack with a portion of the point off. These cavities may well be filled with platinized foil, which makes a very hard filling. In this classification, we have forty-eight potential areas where foil may be used. I have patients with fillings of this class, made

with platinized foil, that have given service from twelve to fifteen years, showing no appreciable wear; and I have patients who have fillings of all classes that are giving good service after from twenty-five to thirty years.

The finest demonstration I ever saw was given in my own office. It was an exhibition of the best gold foil restorations that I ever had the pleasure of seeing. There were about ten cavities, all Class 2, and the fillings were perfect in every respect, outline form, condensation, structure and contact points. The mouth was perfectly healthy and the fillings had been in for forty-seven years. These fillings were made by H. S. Bettis, of Boise, Idaho, who, on receiving a letter from me complimenting him on his work, wrote:

> I certainly can agree with you that the best replacement of lost tooth structure is and always has been done with gold foil. In spite of all the substitutes and short cuts of the past decade I can see nothing to shake my confidence in honest gold foil work, which I believe will be standing as a monument to the operator who follows it when the substitutes are in their graves.

From my observation, there are few dentists that have a good keen set of the latest cutting instruments. They do not realize what good instruments will do for them. A good instrument with a good Arkansas Stone to keep it sharp is a great asset to a dental equipment.

Class 1 cavities are simple in design and easy to prepare. No extension for prevention is required, but merely the following out of the fissure. The simplicity of these cavities does not lessen the seriousness of their neglect. These fissures should be thoroughly examined in the mouth of young patients and, if found faulty, immediately prepared and filled. If these defects are neglected until a large area becomes decayed, a large cavity may result in which noncohesive foil may be used to advantage.

Class 5 cavities are very easy to prepare and most of them are easy to fill. Some difficulty is experienced in adjusting the rubber dam. I use a Hatch clamp to keep the rubber up under the free margin of the gum, exposing the gingival margin of the cavity. These cavities on the linguogingival surface are a little harder to fill, but, in many cases, it can be done. After the dam is adjusted, it is a simple matter to remove most of the decay with a spoon, wipe across the area with a round bur, then, with an inverted cone bur, flatten the base and slightly undercut the surrounding wall. If the cavity is of the right dimension, noncohesive foil with cohesive may be used, affording a very rapid and efficient operation. In a shallow cavity, all cohesive foil may be used. This makes beautiful restorations and is very compatible with the gum tissue.

Restoration of Class 3 and 4 cavities with gold foil is a most lasting operation. The esthetic qualities are objectionable to many, but these fillings when faced with platinized foil are less noticeable. These fillings are also better in the fourth class as they are much harder and will not stretch.

This is merely an explication of the use of gold foil in answer to the many statements of men that they find no place in their practice for its use; to stimulate the use of the roentgenogram in examining the teeth for cavities, and to interest the profession in the conservation of tooth structure.

I am most happy to see the wave of interest in the use of gold foil that is sweeping the profession. Not in years has there been the interest that there is today.

PRESCHOOL AGE DENTISTRY*

By FRANK A. DELABARRE, A.B., M.D., D.D.S., Boston, Mass.

DENTAL caries is the major problem of our profession. We have not been able to prevent its occurrence and are lamentably weak in attempts to control it. A careful study of my own general practice some years ago revealed that a selected group of adult patients who had been regularly cared for twice a year over a period of twelve years had, at the close of that period, more fillings and substitutes than at the beginning.

In spite of all the conscientious efforts and the expenditure of an average of seven hours a year for each patient, the result was a relative failure in control.

If the same test were applied to any large group of practitioners, such a finding would probably be confirmed, and, if it were, the profession would be placed on the defensive as to the adequacy of the methods employed and the objective in mind.

Our objective today is changing from repair of defects to hopes of prevention. Even the highly developed, admirable technic of today is making no headway in controlling the appalling incidence of caries and its disastrous effects on health. The real fault lies in applying the remedy too late in life.

At one of our large universities, in the Fall of 1930, 952 freshmen, approximate age 18, were examined with the following findings: 3,802 cavities; 166 abscesses; 228 devitalized teeth; 405 missing teeth; 106 crowns, bridges or plates, and 1,960 impacted teeth.

If the number of corrected defects had been noted, the average for the incidence of caries would be very appreciably raised. Eighty-three per cent of these students had been given regular dental attention. Only seven of the 952 men had neglected their teeth.

A survey of 3,000 8-year-old children in Massachusetts, undertaken last year for the White House Conference on Child Health and Protection shows no diminution of the incidence of caries for that age, an average of more than six cavities and one and eight tenths abscesses per child being found.

It should be noted that Massachusetts has more than 200 clinics for children alone, perhaps more than any other state, and the state department of health and other organizations have made an intensive effort toward dental health education.

In a manufacturing town of 25,000 in the same state, 261 children, all under 6 years of age, about to enter school, were examined and found to average eight and nine tenths open cavities and one abscess each. One child had thirty-three cavities, and one child, seven abscesses.

In that town, every one of the twenty dentists subscribes to the principles of dentistry for children and are asking

*Read at the Seventy-Fifth Anniversary of the St. Louis Dental Society, St. Louis, Mo., Dec. 7, 1931.

parents to send them the youngest children.

The same picture of devastation and disease at the ages of 18, 8 and 6 is evident in spite of all of dentistry's efforts to control it. The conflagration that is raging at 6 and defying all our resources is still burning unabated at 18 and will continue to smoulder throughout life, unless we awake to the hopelessness of present methods of control.

There is a bright side to this depressing picture of childhood, so seriously handicapped at the threshold of life, in the knowledge we have, which needs no figures for proof, that a tooth does not become carious before its initial appearance. The child in whom eruption of the deciduous teeth is just completed, at 2½ years, presents, in the vast majority of cases, a mouth free from caries and of good functional development.

You have already anticipated the logical and inevitable conclusion that the only hope of successful control lies in the application of dental attention to the early years of childhood immediately after the eruption of the teeth: preschool age dentistry. There is no alternative.

The obligation lies squarely on the profession and is the personal responsibility of every general practitioner. At that age, the insertion of tiny fillings in developmental defects such as pits and fissures of the enamel, wherever a standard, fine explorer may catch, will prevent or control caries in the areas of most frequent occurrence. Periodic attention, with frequent appointments and the same procedure applied to each tooth as it erupts, will give the same protection.

An exceptional instance of this was observed at one of our dental schools this fall, when a man, aged 92, was examined in the clinic and there were found in his molars small gold pit and fissure fillings that had given protection by a lifetime of service of over eighty years.

To enter this neglected field of professional endeavor entails the adoption by the operator of the new objective of the profession, health service, his adjustment to a new and delightful clientele and a modification of technic to a slight extent. The psychologic approach to the child is easy if one can rid himself of his adult notions and prejudices and can reach the level of the child's interests and understanding. The value of the service rendered is so overwhelmingly greater than any other type that it disposes of any objection that it is economically unsound.

If further argument is needed on that point, analyze the hour requirements for service. A competent authority estimates that it will cost no more in hours to serve a child adequately from the age of 2½ up to 18, than it would to put the 18-year-old freshman's mouth in passable condition through extensive repairs. The contrast in terms of health, freedom from pain and all the other attendant handicaps of the old style procedure, as well as the prognosis of the two cases for the future, is a compelling argument.

If a manufacturer had the same opportunity to put on the market a vastly superior article with no increase of production cost he would not hesitate one minute.

There is a grave danger to the reputation of the profession in this situation. The public is being educated through many agencies as to the advantages of this service for their children. If, for any reason, they are unable to get such service, confidence in our professional honesty and purpose will be lost.

It has been said that all dental effort

has a preventive value. That is true; but if the service begins with the preschool child in the manner advocated and is conscientiously followed up to young adult life, it will prevent not only the deplorable end-results, such as development of abscesses, extractions, replacements and systemic involvment, but also a large percentage of the very item of advanced caries that leads up to them, which occupies so much of the time and effort of the dentist who is content to follow the old procedure.

Prevention is effective in inverse ratio to the age of the patient; in other words, the younger the patient, the more effective will be the prevention. Preschool age dentistry today has to its credit by far the largest measure of preventive results and a much more effective control.

It is not my purpose to discuss pure prevention, as applied directly to the unknown cause of caries in a manner parallel to medical effort in the elimination of communicable disease. Nor is it desirable at this moment to go back in point of time beyond the age advocated as appropriate for beginning our effort at control, but it is evident to all of us that the problem is one of growth and development, influenced by heredity and environment from the time of conception. It needs the cooperation of all science and of all agents concerned with the health of mankind for its solution.

Dentistry's contribution to that effort is very small, but it is nevertheless important.

Our profession needs today the cooperation of the obstetrician and pediatrician to minimize the necessity of his work by insuring to the child a better physical equipment. The problem of prevention in its larger aspects and the indicated need for the very earliest application is fundamentally a medical one.

Our present belief is that dietary control of the mother during the periods of gestation and lactation, and continued for the child in infancy, would do much in limiting the developmental defects in tooth formation; these defects which invite the appearance of initial caries and constitute our first and main point of attack.

The question now arises: What needs to be added to the existing dental procedure to make preschool age service effective. They are the things necessitated by our new health viewpoint.

The White House Conference emphasized repeatedly that the *child* must not be lost sight of no matter what particular part of its body was being considered by the specialists. So we must not only consider the restricted area that concerns us so intimately, but also all of our procedures must be modified and refined to best serve that wonderfully complex human organism, the child.

Incidentally, an approach to the child that will not arouse its suspicion, antagonism or fear, but rather gain its confidence and cooperation, is a prerequisite. Without that, no effort can succeed.

First, there must be an estimate of the health quotient of the patient, arrived at from the family and personal history of the patient, based on a medical report, if available. In addition, the data obtained from the observations by the operator of the common indices of health or disease, such as height, weight, posture, gait, bodily growth, color and mental and physical reactions to outside stimuli, and the original condition of the mouth and teeth. This quotient is essential to diagnosis, affects the prognosis and modifies the treatment. Even the periodicity

of appointments cannot be intelligently determined without this background.

Omitting the familiar detail of examination of the teeth for the detection of defects, and their elimination by technical procedures, I shall mention some items of service not commonly employed that should be adopted as essential to this type of dentistry. The case record should include successive data on the height-weight index to show the general trend of growth, and also the occurrence of bodily disease of any nature that might influence local conditions; in short, a continuance of the personal history. The data on eruption of the teeth should also be noted, since delayed eruption may suggest a systemic disturbance. The customary record of chair service is, of course, included.

Such data as these would be of great value to the research man investigating the problems of childhood. Growth, development and function are vastly important during these early ages and should be closely studied for the purpose of anticipating and estimating any departures from a normal course of events. Such an estimate can be based only on intimate knowledge of the normal. Compare the skull and dentition of the 3-year-old child with that of the adult, and you get a picture of the great changes that must occur in the intervening years. Each year of life shows some change in size, development and functional relationships of the various units, and, for each stage, there is a norm.

Any organ exists only to function. In evolution, Nature eliminates organs that cease to function. We cannot consider a mouth that is free from disease as being up to standard if function is impaired. The function of the mouth is a complex one, with the various anatomic units performing several separate functions. The main function of the teeth is mastication, but they also share with the lips, tongue, cheeks, etc., in the function of speech, swallowing and changing of expression. A good arrangement of the teeth is essential to efficient function, and that arrangement is constantly changing throughout the period of growth.

In physical attributes, the deciduous dentition differs greatly from that of the adult, in tooth form, size, arrangement and relationships. For the study of functional occlusion, successive impressions should be taken each year and models made to show the changes. Roentgenograms are indispensable to the detection of supernumerary, missing or impacted teeth and also to reveal the rate of growth of the teeth and jaws. Such a series of data would also be invaluable in determining the most advantageous time to commence correction of malocclusion.

Roentgenograms are also indispensable in the detection of caries, as is shown by examination of the students. Careful examination with mirror and explorer recorded only 1,842 cavities. The roentgen-ray examination added 1,960 more to that number.

A matter of particular importance is the early detection of faulty functional habits. It is well nigh impossible to break a long established habit. The best method of correction is the establishment of normal habits through exercise.

Function influences form, and bad function results in malformation. Breathing through the mouth is an example of malfunction that results in a characteristic bad facial expression, with an open mouth, undeveloped nose and upper lip, faulty speech and possible malocclusion. Lack of mastication, or bolting the food, deprives the parts of

exercise essential to growth. All of the sucking habits induce faulty function. Improper use of the lips and tongue in speech upsets the balance of functions. Bad posture habits in standing, sitting or lying down are to be avoided.

It is not the amount of force exerted in these and other habits, but the constant repetition that does the damage.

One of the greatest advantages to the child that will come from preschool dental attention is the preservation of the deciduous teeth in health and function through the natural period of their life. There is no other greater disturber of function nor greater contributing factor in malocclusion than premature loss of the deciduous teeth. Their importance and value is apparently not appreciated by the parent or the profession. The parent is still being advised that "it is not worth while trying to save the deciduous teeth."

An orthodontist can speak to you thus without apology, but with confidence in the advice given; without conceit, but with humility because the small measure of knowledge gained by his study of these questions has revealed the boundless reach of Nature's ways.

This paper is in no sense a destructive criticism of our profession, but a call to cast off the old ideas that restrict and hamper future development. Scientific knowledge that has come to us in the last two decades has widened our horizon, increased our responsibilities and given us the new objective of service for health, entailing the necessity of a new evaluation of all our procedures.

Dental education, a problem that is never static, must conform to new requirements, with the emphasis placed on "preschool age dentistry."

Thinking always of the child, Medicine too must be led to the knowledge and appreciation of the relationship between oral and systemic pathology and include its teaching in the undergraduate curriculum. The oral cavity is part of the organism. To neglect a consideration of it in diagnosis and treatment is an absurdity.

Our profession does not exist for its own sake any more than does our government, which was formed to give protection to the individual and society in seeking "life, liberty and the pursuit of happiness."

If we know how to serve the public better, that service must be made available for their needs, and they must not be kept in ignorance of the progress made. The adoption by the profession at large of this outstanding service is the best answer of all to the disturbing threat of "state dentistry."

Specialization would be entirely inadequate to compass a task of such magnitude.

It is the duty of organized dentistry and of every practitioner to help to educate the public to the fact that the highest degree of prevention and control of oral lesions is to be found in the frequent and systematic service beginning with the earliest years of childhood, correlated with a medical service similar in purpose and application.

This is preschool age dentistry.

520 Beacon Street.

THE PATHOLOGIC POCKET AND ITS TREATMENT BY INSTRUMENTATION*

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IT is axiomatic that successful treatment of the pathologic pocket depends on a comprehensive knowledge of the normal and pathologic conditions of the tissue involved. At the present time, there is much discussion among histologists in this country and abroad as to what constitutes a normal gingiva and just where and when pathologic change begins.

The formation of the gingival sulcus or "normal pocket" as described by Becks[1] is most interesting. As the tooth erupts through the mucosa, the embryonic epithelium of the enamel immediately fuses with the mouth epithelium. Then, a very slow degeneration of the enamel epithelium commences at the point of fusion, followed by a proliferation of the mouth epithelium, in an attempt to prevent bacterial invasion into the subepithelial tissue. The bottom of the gingival sulcus is therefore always to be found at the lowest point of the degenerating enamel epithelium. The walls of the sulcus are lined by remnants of the degenerating enamel epithelium still adjacent to the tooth surface on one side and the mouth epithelium on the other.

In the same ratio as this, progressive degeneration and proliferation continues apically, the free margin of the gum atrophies and keeps the gingival sulcus very shallow. The depth of the sulcus can be considered "ideal" if it is less than 1 mm. This condition is very seldom found except during the process of eruption. These degenerative changes of the enamel epithelium are finished when the bottom of the sulcus has reached the cemento-enamel junction—in advanced age. Before it reaches this point, the enamel epithelium proliferates along the surface of the cementum, creating a new epithelial attachment. Most histologists believe that this proliferation is due to an inflammation, as all sections of clinical normal gum tissue show an infiltration of round cells beneath the bottom of the sulcus. On the other hand, evidence has been presented by other investigators that this epithelial proliferation has nothing to do with inflammatory change, but represents a physiologic defensive measure.

In contrast to Becks, Gottlieb[2] believes that the gingival sulcus is formed by a simple loosening of the enamel cuticle from the deeper layers of the enamel

*Read before the Periodontia Section at the Third Triennial Session of the Pacific Coast Dental Conference, Seattle, Wash., July 7, 1932.

1. Becks, Hermann: Normal and Pathologic Pocket Formation, J.A.D.A., 16:2167 (Dec.) 1929.

2. Gottlieb, Bernhard: Der Epithelansatz am Zahn, Deutsch. Monatschr. f. Zahnheilk., 39:142, No. 5, 1921.

epithelium; while Weski[3] states that it is the result of an intra-epithelial splitting. This fundamental question is still being discussed by histologists.

If we follow Becks in his discussion of the formation of a pathologic pocket, we see that, under certain conditions, the degeneration of the enamel epithelium proceeds very rapidly, reaching the cemento-enamel junction early in life and even passing it, thereby involving the new epithelial attachment. As a result, a pocket is formed the depth of which is determined by the degree of inflammation of the paradentium. Clinical observation has taught us that this picture of a pathologic pocket can arise from two different processes:

1. Local agents such as calculus, food débris and mechanical injuries will cause a marginal suppurative type of gingivitis which results in a rapid destruction of the embryonic enamel epithelium and deepening of the shallow sulcus. This picture may stay over a long period of time, even over a period of years, without involving the deeper parts of the paradentium, i.e., the bone, pericemental membrane and cementum.

2. A systemic disease attacks the alveolar process and the covering gum tissue, as, for instance, occupational disease, vitamin deficiencies and metabolic disturbances, without primary inflammatory changes of the gum tissue. As a result of this systemic condition, the tissue resistance to infection is lowered and a secondary inflammation occurs. This, in turn, leads to destruction of the epithelial attachment and deepening of the pocket.

In the second type, we are dealing with endogenous conditions, which, in many cases, are not clinically evident until the pathologic stage has been reached; hence, early diagnosis is difficult. The roentgenogram will often show an area of lessened density in the interdental alveolar process, indicating a bone disturbance, yet there is no clinical evidence of a deep pocket. The procedure would be to correct trauma, restore function, if possible, and refer the patient to an internist for the diagnosis and treatment of the systemic conditions. In many cases, we have not appreciated the importance of this roentgenographic evidence, and have allowed the tissues to reach the pathologic stage before recognizing it.

In the treatment of any disease, the best therapeutic procedure is the one which will rapidly change the pathologic to a physiologic condition with the least possible damage to the involved tissues, and the same principle should be applied to the treatment of this lesion.

Clinical experience seems to show that it is possible, by proper instrumentation, to obtain an attachment of the soft tissues to the surface of the cementum and, in many cases, a regeneration of the alveolar bone. T. Sydney Smith[4] states that "the separated tissues will form a vital reattachment to the cementum of living teeth and completely and permenently obliterate the pyorrheal pockets." Box,[5] in a bulletin published in 1924, shows several photographs from sections of a tooth treated by McCall, stating that "these sections show a reattachment

3. Weski, O.: Die chronischen marginalen Entzuendungen des Alveolarfortsatzes mit besonderer Berucksichtigung der Alveolarpyorrhoe, Vierteljarsschr. f. Zahnheilk., 37, No. 1, 1921; 28, No. 1, 1922.

4. Smith, T. S.: Successful Scientific Treatment of Periodontal Diseases, D. Items Int., 38:437 (June) 1916.

5. Box, H. K.: Studies in Periodontal Pathology, Bull. No. 7, Canadian D. Res. Found., May, 1924, p. 75.

of the connective tissue to the cementum surface." Simonton[6] says: "We believe that instrumental treatment of pyorrhea is beneficial, that some regeneration takes place, and that the histologic picture of treated tissue is essentially constructive, while that of the diseased tissue is essentially destructive." Merritt,[7] Stillman[8] McCall[9] and others have presented evidence of this fact.

In order to have an attachment to the cementum, it must of necessity be a living structure, and not a "dead, pus-soaked tissue," as stated by some writers. (G. V. Black.) Nature requires the same conditions for healing here as in others parts of the body—the tissues must be vital with freshly exposed surfaces and be in undisturbed apposition until union is complete.

The selection of suitable instruments is the first consideration in the treatment of this pathologic condition. I favor the spoon-shaped scalers (Younger type) because they permit of strokes in all directions and the operator is able to reach the bottom of the pocket with greater ease and more thoroughly than with either the hoe-shaped or straight-edge instruments. The shank and blade are very thin and so shaped that it is possible to reach all surfaces of the teeth with less lacerating or stretching of the tissues. Consequently, there is almost no operative and postoperative pain, and local anesthesia is unnecessary in the majority of cases. I use cone-socket scalers fitted to an aluminum handle which transmit to the fingers a magnified sense of touch. This is important because the field of operation is covered by the gum tissue, and it is only by this means that the operator is able to recognize the different structures.

The treatment of a pocket consists first in removing all of the calculus, beginning with that which is exposed and gradually working along the root surface to the bottom of the pocket. It must be done with extreme care on the cemental surface because deep cuts will expose the dentin, thereby preventing attachment of the soft tissues at that point. This process consists of stroking the blade of the instrument in all directions so that the surface of the cementum will be thoroughly and continuously planed, the object being to remove all foreign agents including necrotic pericemental fibers, thus leaving the surface absolutely smooth and surgically clean. No special treatment need be given to the epithelial lining of the crevicular surface of the gum tissue, since it is apparently destroyed during instrumentation, when, although no special effort is made to do so, the edge of the blade will scarify it enough that the underlying connective tissue will form an attachment to the cementum. Clinical experience seems to prove this statement, and Merritt[10] says: "There are very few, if any, cases in which curettage of the root surface will not at the same time sufficiently break up the epithelial lining of the vascular wall. This is almost inevitable." Some writers advise the use of caustic agents to destroy this lining, but these agents are not self-limiting and are applied by packing the pockets with a saturated bit of cotton which would result in forcing

6. Simonton, F. V.: Results Obtainable Through Instrumental Treatment of Pyorrhea, J.A.M.A., 81:2013 (Dec. 15) 1923.

7. Merritt, A. H.: Periodontal Diseases, Diagnosis and Treatment, New York: Macmillan Co.,.1930, p. 255.

8, 9, Stillman, P. R., et al.: Periodontal Disease, Its Cause and Treatment, D. Survey, 8:23 (Feb.) 1932.

10. Merritt, A. H.: Treatment of Periodontoclasia by Subgingival Curettage, J.A. D.A., 19:279 (Feb.) 1932.

the tissues away from the roots. This is a disadvantage, as primary healing depends on a close adaptation of the tissues to the root surfaces.

The important part which the blood plays during the instrumentation and healing of the pocket has been overlooked by many clinicians. T. Sydney Smith[11] writes:

> The wounds are never washed at any time after the operation is commenced. The soft tissues are left in such close contact with the roots that thorough washing is almost impossible. Full reliance is therefore placed on the cleansing properties of the blood. As liberated blood has the constant tendency to coagulate, it incorporates the fine particles of calculus in the meshes of its fibrin. This permits the instruments to bring these particles to the surfaces more thoroughly than could be accomplished by other methods. Antiseptics and germicides are never employed. The writer relies entirely on the bactericidal action of the tissues to overcome the remnant of micro-organisms which are left in the wounds.

The mouth should be treated in a methodical manner, the operator commencing at some definite point and proceeding from tooth to tooth, until all pockets have been curetted. Roentgenograms are indispensable as evidence of the location and depth of the pockets. Without them, no attempt should be made to treat a case. Loosened teeth should be stabilized by the use of a splint, which is applied at the time of treatment and retained for a few weeks, by which time the tissues have become firm and tight around the teeth, thus giving them a natural support. Occlusal trauma should be corrected at two different periods: (1) before treatment of the pockets, when only sufficient grinding is done to relieve excessive movement of the affected teeth, and (2) after completion of treatment, when the grinding is carefully finished so that all the teeth are in as nearly favorable occlusion as possible.

Clinical experience has shown that the inflammatory process will cause the teeth to change their position, and when the tissues are restored to a state of health, they settle or sink back into their original position. As an example of this, I would like to report a case in which the upper right central incisor was about 1 mm. longer than the left central, very loose and slightly rotated, and had deep pockets on the mesial and lingual surfaces. I first shortened it to the point where the two teeth were the same length, and then the usual routine treatment for such cases was followed. At the present time, the tissues are healthy. It is striking to observe that the right central incisor is quite firm, but it is about 1 mm. shorter than the left central incisor.

The polishing of the crowns and denuded root surfaces should never be attempted before the tissues have completely healed, as some of the polishing agent might be forced beneath the margin of the gum, and thereby interfere with the proper healing of the pocket. Small rubber cups filled with a suitable polishing preparation are used for the labial, lingual, buccal and occlusal surfaces, while the interproximal are polished with fine cuttlefish strips and flat floss charged with the polishing material. It is essential that the strips and floss be properly and securely held by the fingers, so that the gum septum will not be lacerated by the sharp edge of the linen strip or bruised by the tape snapping through a tight contact point.

The importance of this interproximal polishing cannot be emphasized too strongly. Many general practitioners omit it entirely when they "clean teeth,"

11. Smith, T. S.: Inflammatory Diseases of the Gingival Margin and Periodontal Membrane, D. Cosmos, 58:1239 (Nov.) 1916.

and the average patient uses dental floss indifferently, or not at all — usually the latter. These surfaces therefore are practically never polished. Food débris and salivary calculus keep the septum in a chronic state of inflammation, and, as was described previously in this paper, a pathologic pocket results. This is one of the reasons that we usually find the deepest pockets between the teeth.

Home care is very important. Success or failure of the treatment of a pathologic pocket depends to a large degree on the cooperation of the patients. It is our responsibility to teach them how to care for their teeth, and the best method of doing so is to take a toothbrush and actually demonstrate its use in their mouths.

The statement is often made that there can be no rebuilding of that portion of the alveolar process which was destroyed as the pocket developed. This is a fallacy. There is sufficient roentgenographic evidence in the files of many periodontists to furnish undeniable proof that bone does regenerate. In many cases, the bone matrix is not always completely destroyed, and when the tissues are properly treated and restored to a state of physiologic health, reossification of the fibrous structure takes place. That it does not occur in every case is due probably to the complete loss of the matrix, as a result of an extensive formation of granulation tissue. Granulation tissue is the product of chronic inflammation, and, on elimination of the sources of irritation, it may be reorganized into healthy tissue. Extensive curettement, therefore, or removal of this tissue for the purpose of healing the pocket is not necessary.

It is quite true that this method of treating a pathologic pocket is rather difficult and that it requires a certain degree of skill, but the successful results justify the effort. The fact that the field of operation is hidden from view and that the operator must depend on his sense of touch is no argument against instrumentation. Many men make the mistake at first of attempting to treat advanced cases which are beyond their degree of skill at the time, and of a certainty the result is discouraging. If the practitioner would begin by treating shallow pockets, thus familiarizing himself with the use of the instruments, he would soon develop his technic to the point where he would literally see with his finger tips, and then successful treatment of the deeper pockets would be but a matter of practice.

CONCLUSION

I wish to make a plea to the family dentist to suspect the presence of disease in every adult mouth. Not that it will always be found, but that, by following such a plan, any disturbance of the tissues will be discovered much earlier than otherwise. A good routine practice, if economically possible, is to have a complete set of roentgenograms taken every two years, as it is only by this means that one may determine just what changes are taking place in the alveolar bone.

As the development of a pathologic pocket is usually a slow process, early diagnosis is possible. Many men do not realize the significance of gingival inflammation or its consequences. As a result, unnecessary destruction of tissue occurs, systemic infection follows, and who knows but that the patient's life may be shortened by the presence of these foci of infection.

This is a responsibility which we as a profession have not taken seriously. The general practitioner, therefore, becomes a very important factor in the prevention and treatment of a pathologic pocket.

THE MAXILLARY SINUS*

By WILLIAM L. SHEARER, A.B., M.D., D.D.S., F.A.C.S., F.A.C.D., Omaha, Nebr.

IT is well-known that the maxillary sinus is very important from the viewpoint of the dentist or oral surgeon who is performing operations on the teeth and jaws of a type which may be associated with this sinus. I have long realized that there should be a much closer association of the oral surgeon and the rhinologist in combating infections of the maxillary sinus.

In 1905, I devised an operation known as alveolectomy. Its original purpose was to prepare the mouth for more satisfactory dentures, for I was constantly seeing patients who, after the simple extraction of teeth, had difficulty in wearing plates owing to jagged edges of bone, too much prominence in certain places, etc. Later, stimulated by the desire of medical men for the complete eradication of pathologic mouth conditions in focal infection cases, I realized that this operation promised to meet the requirements, and a technic, including partial and complete alveolectomy, was perfected.

In a word, the operation of alveolectomy consists of a reflection of the mucoperiosteum on the buccal side up to and above the root ends of the teeth and on the lingual side about one-eighth to one-quarter inch. After extraction of teeth and removal of the pathologic areas, the remaining jagged edges of bone are trimmed and the mucoperiosteal flaps are returned to position and sutured with horsehair.

The procedure, with its complete exposure of root-end disease, permits visualization of the diseased processes. It is common knowledge that the apices of the first and second bicuspids, and the first, second, and third molars, are in close proximity to the floor of the maxillary sinus. Dentists have long known that these teeth are just as subject to apical infection as are those in any other part of the mouth. It has been my experience to see, in many instances, not only infection of a normal maxillary sinus, but even the escape of a tooth into the antrum from attempted removal of these teeth by simple extraction and blind curettement.

Statistics are at variance as to the primary cause of certain types of maxillary sinus infection; that is, as to whether such infections are of dental or nasal origin. I have heard it stated by men in various sections of the country that fully 75 per cent of such cases are of dental origin. From observation extending over a period of years and including cases referred after extraction, in many of which I had the opportunity to perform an alveolectomy, when a good history could be given it was learned that the mucous membrane of the maxillary sinus was punctured, and thereby infected at the time of the removal of the teeth. I am convinced that the

*Read at the Seventy-Fifth Anniversary of the St. Louis Dental Society, St. Louis, Mo., Dec. 7, 1931.

number of cases primarily infected by diseased teeth is comparatively small and the foregoing figure is erroneous, owing to the fact that the signs and symptoms of maxillary sinus disease are often associated with or follow the removal of infected teeth. This statement is supported by the fact that, during the course of an alveolectomy, it is often possible to remove the bony floor of the sinus and find a healthy mucous membrane, and, if this is left undisturbed, a complete subsidence of all symptoms pertaining to maxillary sinus infection will follow. I believe from my own experience, plus consultation with my colleagues pertaining to infections of the maxillary sinus, that the majority of the so-called infections of the sinuses of dental origin are instituted by the members of our profession at the time the teeth are removed.

It is not my purpose to discuss all the various operations designed for draining the chronically infected maxillary sinus, and yet, in the course of a day's work, one not infrequently sees patients in whom a healthy tooth has been injured or the terminal branches of the infra-orbital nerve unnecessarily severed when certain accepted procedures have been followed by the rhinologist in order to establish drainage by the oral route. With full knowledge and appreciation of the fact that the dentist is just as unprepared to operate through the nose as is the average rhinologist to operate on the teeth and jaws, I am making a plea for closer cooperation between the oral surgeon and the rhinologist. In no sense do I propose drainage through the mouth in all cases of maxillary sinus infections; for, in my early experience, I had the misfortune to attempt relief by an approach through the mouth, only to aggravate the condition.

If we bear in mind the fact that when the sinus infection is due to root-end disease (which can be definitely proved by proper roentgenograms) there is a chronic osteomyelitis of the jaw bone involving the floor of the maxillary sinus and often accompanied by polypi and free pus, it seems reasonable to presume that the best management of such cases would call for a combined operation through the nose and the mouth. Strange as this may seem, it is not a common practice, but, in a few quarters where oral surgeons and rhinologists cooperate, excellent results have been obtained.

Most satisfactory results are obtained by this procedure. A partial alveolectomy flap should be made, eliminating the disease at the root ends of the teeth involved in contiguous infected bone areas. When a mucoperiosteal flap is reflected from the cemento-enamel junction of the teeth, the terminal branches of the infra-orbital nerve are not severed; which produces a numbness for some time and is a source of some complaint. One can then see the field of operation perfectly and avoid destruction of adjoining teeth.

If there are no teeth to be removed at the time of the sinus operation, the incision should be made about a quarter inch above the cemento-enamel junction of the teeth, extending straight back along the gum and up over the tuberosity. Then, the incision is brought forward to the central incisor with an S curve upward about a quarter inch. If there is much necrotic process in the floor of the sinus at the root ends of the teeth, the closure of the flap must be painstakingly done to avoid a postoperative opening. Mattress sutures supported by continuous over and over whip sutures usually are sufficient. It is my opinion that this incision should be made

whether there is a pathologic mouth condition or not. If there is an approach to be made to the maxillary sinus from the mouth, any other incision does not respect normal anatomic conditions, and, when we fail to respect normal structures, we have failed to a more or less degree in our objective, to say nothing of the comfort to the patient, which should always be our desire.

No matter what procedure is followed in the mouth, the disease in the floor of the maxillary sinus, produced by necrosis and invasion of the sinus from root ends of infected teeth, must be eliminated. In other words, the point of invasion is at the root ends of certain teeth in proximity to the sinus. Therefore, the disease of the bone and alveolar process in contact with the mucous membrane of the maxillary sinus must be eradicated, and this then becomes the proper point of attack. When this has been thoroughly accomplished, the mucoperiosteal flap should be returned and the wound closed completely. Subsequent treatment should be completed by the nasal route.

The technical steps of this operation cannot be perfectly outlined in a paper. It can be demonstrated perfectly only in an operating room, the place where all surgery should be learned.

LIBRARY BUREAU OF THE AMERICAN DENTAL ASSOCIATION

By JOSEPHINE P. HUNT

SEVERAL years ago, the American Dental Association recognized the need for a dental library—one which would be not merely a storehouse for dental magazines and books, but which would make readily accessible to the profession the published information on whatever subject might be considered of special interest. In the case of the American Dental Association, as is true of any nation-wide organization, the majority of contacts must be carried on by mail. Therefore, the greatest problem was to make accessible by mail the literature in the library. To meet this problem, the package library was evolved. These packages, like the books, are circulated by mail.

A package library is a collection of clippings, reprints and abstracts on some specialized phase of dentistry. To date, packages have been compiled on almost three hundred distinct subjects. The average package library contains about thirty articles. When a large number of requests for a particular package indicates a need, a duplicate package is compiled. Duplicates have been made until there are now between seven and eight hundred packages. In some instances, many duplicate packages on one subject have been insufficient to take care of the requests. In such cases, it is necessary to have a waiting list. The names of the dentists asking for material are put down in the order in which the requests are received and they are sent packages as their turns come. Pack-

ages on new subjects are compiled as asked for. Package libraries may be borrowed for a period of one week after date of receipt, and unless reserved for another borrower, an extension of time will be granted on request. The rental fee for a package library is fifty cents.

To make the package library service possible, access to a huge number of magazines and reprints was necessary. To procure these magazines and reprints, an appeal was sent to the publishers of the dental magazines, asking their cooperation in securing the necessary journals. Their response was immediate and generous, and grateful acknowledgment is made to those publishers who have, year after year, contributed not only free copies of their journals, but, in many instances, reprints as well. Individuals and groups too numerous to list here have likewise made frequent donations, and it is our wish to express sincere appreciation of their thoughtfulness and continued support of the library.

Frequently when a package library is requested, the purpose for which it is needed is also stated. Before preparing a paper, writing a book or giving a clinic, many men like to consult the package libraries to see what has previously been written on a subject. Sometimes, too, the statement is made that some particular problem has been encountered in practice which requires special study, and it is for this reason that the package is requested. When a dentist asks for a package library, an effort is made to include any articles which he may request in particular. Some members consult Dr. Black's Index of the Dental Periodical Literature to select articles by certain authors and ask that as many of these as possible be included in the package. Others have heard certain papers read at meetings and wish to refresh their memories regarding various statements. When no special mention is made as to what articles are particularly desired, it is the policy to include as large a percentage of recent material as possible.

Not only is the package library service used by the members of the Association in this country, but packages are also requested by study clubs, clinics, etc., abroad. During the past year, material has been sent not only to Canada, England, New Zealand and Australia, but also to Belgium, Italy and Mexico.

Lists of package libraries, giving the names of those which have been compiled and are available for circulation, are published in THE JOURNAL in the announcement section at frequent intervals.

Members of the Association, no matter where located, are also privileged to borrow books from the Association Library, the only requirement being that a $2.00 deposit be sent in for each book which is to be borrowed at one time. Many men send quite a long list of the books which they would like to read, and these are sent one at a time as available, as nearly as possible in the order designated.

Special attention is given to the acquiring of new dental books as they are published. Additions are made, of course, to the reference and standard works occasionally, but as the majority of our members are more interested in recent publications than in the older volumes, particular effort is given to increasing this part of the library.

Lists of the recent books available for circulation are published in the announcement section of THE JOURNAL three or four times each year.

Inquiry is frequently made as to why

greater publicity is not given the Library Bureau. Each time that a list of the new books available for circulation is published in THE JOURNAL, from three or four to fifty or more requests for each book are received. Even though the Library Bureau has a number of copies of the more popular books, it requires several weeks and sometimes months to take care of all of the reserves which have been made for one particular book. The calls for package libraries following each published announcement are likewise more than can be complied with immediately. It is for this reason that greater publicity is not given the Library Bureau.

Books may be not only borrowed but also purchased through the Library Bureau. When the list of books which may be borrowed is published, the purchase price of each one is given for the benefit of those who may wish to buy books. Information will always be furnished on request regarding the price, date of latest edition, etc., of books which are not listed.

The important dental magazines published in this country are received regularly as are also those of England, Canada, New Zealand, Australia and India. In addition to these publications in English, journals from Austria, Belgium, Denmark, Holland, France, Germany, Italy, Japan, the Scandinavian countries, Spain, Switzerland and several South American countries are mailed to the library regularly. Nineteen of the more important magazines devoted to such subjects as anesthesia, biologic chemistry, dietetics, medicine, pharmacy and public health are also sent in. Many of these journals are bound each year and added to the reference volumes of the library. The bound volumes of magazines are not loaned out but are kept in the library for reference purposes, as are also the transactions, dictionaries and other similar material.

Occasionally, when very little information on a subject has appeared in the dental literature, a bibliography of the articles which have been published in the medical literature is sent out either alone or to supplement a package library. It is then a comparatively simple matter for the dentist to look up the articles in the nearest medical library.

A most cordial invitation is extended to our members to visit the library, in order to better acquaint themselves with its facilities.

For recent additions to the library, see the announcement section of this issue of THE JOURNAL. In the August and September issues will be found comprehensive lists of the package libraries and books which may be borrowed.

The Journal of the American Dental Association

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C. N. JOHNSON, Editor

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Editorials

75 YEARS!

When the Seventy-Fourth Annual Session of the American Dental Association convened at Buffalo last September, there were but few of our members who sensed the fact that the coming year would usher in the Diamond Jubilee of the organization.

The years have come and gone with the regularity of routine, and it has merely been taken for granted that each year would bring forth another meeting. Little has been thought of the passage of time as it related to the celebration of outstanding epochs in the history of the organization, but almost before we realize it, the present year stands out as a very important event in signalizing a prominent landmark of our development. Seventy-five years of history must be recognized as something to think about.

Other dental societies were in operation before the A.D.A. was organized, but it at once, by virtue of its scope and character, assumed leadership as the one outstanding association of its kind in the dental profession, and this status has been maintained throughout the years of its existence.

Now that the three-quarter century mark is approaching, it would seem fitting that our members take note of the significance of the event, and begin preparation at once for organization of the greatest meeting in the history of the Association. Our membership is larger than that of any other group in the profession, and our various departments are integrated in a logical and effective manner to give the greatest possible service to the profession. More and more, we are aiming to bring the concrete benefits of the organization to the individual offices of the members where they may be made available in every day practice.

In the August issue of THE JOURNAL, we outlined in our editorial pages certain of the agencies through which the Association was serving its members, and incidentally through its members serving the profession as a whole. How any dentist who is eligible can ignore his own interests by failing to join the Association, we cannot understand. The only possible reason is because of lack of knowledge on his part of the privileges that are provided by the organization.

To be able to attend one meeting of the character of the coming Diamond Jubilee would be recompense enough for more than one year's dues. This meeting will epitomize all of the most modern developments in our profession up to this time. It will demonstrate the most recent technical triumphs of the art of dentistry, and provide food for thought in the latest developments of scientific dental research. To fail to signalize this most impressive event in our history would be to miss an opportunity to step up the organization to a higher plane of achievement, and record a definite advance in the development of dental thought.

Begin at once to make your plans for the coming Diamond Jubilee, August 7-12, 1933.

This meeting is to be held jointly with the Chicago Centennial Dental Congress, and the two bodies are working very enthusiastically toward the consummation of an outstanding event.

The various committees have been applying themselves to the task of preparation with a vigor that is typical of the spirit of the men constituting the personnel of the two bodies, and as the plans

are being developed, we can assure our members of a treat in the way of a program that will mark a milestone in the history of dentistry.

The literary program is already well developed, and the response of essayists is very encouraging. Many of the most distinguished men of the profession have signified their intention to contribute, and the science and art of dentistry will be exemplified to a very high degree. The clinical program is also well under way, and the practical requirements of the general practitioner, as well as the more highly developed technic of the specialist, will receive the most detailed demonstration.

The presence of the great exposition that will bring to Chicago such a concourse of people from all lands, and particularly from our own country, will afford a convenient opportunity for dentists everywhere to come to this meeting under the most favorable auspices.

Summer in Chicago is usually a delightful season, and August is the typical vacation month. Not only this, but the Chicago profession extends its welcome with open arms. It is proud to be hosts, and all it asks is that our guests come early and stay late.

THE REPORT OF THE COMMITTEE ON THE COSTS OF MEDICAL CARE

The long looked for Report of the Committee on the Costs of Medical Care, awaited patiently by professional men in particular and also by certain lay groups, has just been issued, and it must be admitted that its findings are proving a source of keen disappointment to thinking people.

The expenditure by the Committee of nearly a million dollars might have had some justification if there had not been at the very outset of its activities an evident bias in favor of ideas that were subversive of the best interests of the professions, and of ultimate harm to the public.

The virus of state medicine, state dentistry and socialistic claptrap of all kinds manifested its presence from the beginning, and every argument was used to bolster up the theory of governmental paternalism as it relates to the professions. As if governments, state or national, knew how professional practice should be conducted!

Nowhere in all of our professional activities has there ever been advocated a more dangerous policy than that recommended by the chairman of the Committee, whereby communities such as cities, counties or states are to help pay the medical bills of all citizens by means of taxes. Socialistic folly could go little farther than this. Such a plan would at once introduce all the evils of political graft, and economic demoralization of the most flagrant character.

Study the spectacle of the administration of politics in this and other countries today, and see what would happen if political control got its clutch on the administration of professional practice. Not only would the professions be ruined, but the people themselves, under the false promise that they were to be protected, would suffer the most utter neglect, imposition and exploitation at the hands of the politician. Conditions would be unspeakable. And we are asked to foster such a policy as this.

Of similar trend is the whole scheme of compulsory health insurance. Edward H. Ochsner, M.D., writing in the December number of THE JOURNAL, says:

> The second common error is that, by some magic, compulsory health insurance is going to escape the favoritism, nepotism, graft and, in fact, all the evils of politics. This is a delusion, with which reformers and the intelligentsia in general are commonly afflicted. The practical men of affairs and particularly the seasoned politician does not fall into this error. Some time ago, during a heart-to-heart conference, a practical politician expressed what he really felt and knew to be true. He said, in substance, that we must remember that "we have government by politics, and you and I or all of us with a hundred thousand others cannot change this situation." And he added: "I do not care whether you remove the control from the city to the state or to the federal government, it will still be controlled by politics."

The intimation by two dental members of the Committee, in a minority report, that "compulsory health insurance under professional control would eliminate the objectionable features" might seem a perfectly natural one, from their point of view; but

does anyone imagine for a moment that if the entering wedge of compulsory health insurance were ever admitted, control would long remain in the hands of the profession? The chief business of the practical politician is to control everything that has a financial angle to it, and the profession and the people would soon be at his mercy for exploitation of all kinds.

Does our profession wish to be subjected to evils of this sort? Do we wish to barter our professional birthright for a mess of political pottage? The paramount consideration in any issue is the ultimate welfare of the people at large, and we are at once confronted squarely with the question: Do we desire that the policies of dentistry be controlled by the profession itself and thus in the best interests of the people or do we wish to turn its control over to the politician for the exploitation of both the people and the profession? The issue is clear cut, and we stand traitors to the trust reposed in us by the pioneers of our profession who first established our professional status, if we yield our prerogative in the slightest degree to the machinations of those who would sell us out and debauch our profession.

In a footnote to one of the recommendations of the Committee, there is the following statement, signed by seven of the forty-eight members:

> We commend the growing tendency in the practice of dentistry toward a division of labor in which a dentist who is also a physician assumes larger responsibilities for the diagnosis and treatment of conditions arising from or related to the teeth, while much of the routine performed by the dentist in the past is delegated to dental hygienists and other technicians working under his direction.

Without specific knowledge, it is our surmise that most of the seven men signed this statement without the slightest knowledge of any of the facts concerning dentistry and merely on information or suggestion from the smallest possible representation on the whole committee. The statement is so at variance with established fact that it is entirely misleading. There is no "growing tendency" toward the kind of "division of labor" to which the committee refers. It is not true, and should not be true that "much of the routine performed by dentists in the past is delegated to dental hygienists and other technicians working under his direction."

The commanding place held by dentistry in the United States has been achieved not by attempting to tack a small dental tail to the medical kite, nor by reliance on others to do the routine work of the profession, but by the genius and initiative of members of the dental profession who have seen the broad vision of dentistry and what it stands for, and have been willing to devote their best endeavors to its consummation.

To do what the committee intimates should be done would be to stultify ourselves in the public eye, and to set dentistry back to where it was in the beginning.

In Minority Report Number Two, mentioned above, and which is reproduced in this issue, there is a definite advocacy of "group practice and group payment." Possibly there are certain circumstances and certain conditions in which group practice is applicable, but as far as dentistry is concerned, it has been an outstanding and noteworthy experience of the past that group practice has, in most cases, failed, and that the fullest development of our profession has come about through individual effort and initiative.

The theory of group practice has always been opposed by the best traditions of dentistry, and this is not to say that specialization has not a perfectly legitimate basis of justification. The greatest advances in the profession have had their source in individual endeavor, and anything that interferes with a close and sympathetic relationship between patient and practitioner works to subvert their common purpose and tends to do away with personal interest. The best and most satisfactory service is seldom or never achieved through the medium of group practice.

The dental profession, mostly from funds furnished by the American Dental Association, has contributed large sums to the study of this subject ostensibly for the purpose of combating the tendency toward compulsory health insurance for all the people, as well as group practice and group pay. Instead of combating it, certain members of the Committee that were appointed to study it have in every way in their power sought to sell the idea to the profession.

We may have more to say on the entire subject in subsequent

issues. Meanwhile, we ask our readers to study a résumé of the report in the Dec. 3, 1932, issue of *The Journal of the American Medical Association,* reprinted on pages 93-107 of this issue.

PERNICIOUS PATERNALISM

In two papers in the present issue, we find the consideration of a subject that requires at this time most careful deliberation. The paper of Dr. Aison on "Government Competition with Private Practice," and the one by Dr. Parkinson on "Facing Panel Dentistry" are referred to, and while they are quite different in treatment, they converge into the same general theme and the one supplements the other quite admirably.

For some time in the recent past, in fact ever since the war, there has been a growing tendency on the part of the Government to usurp certain functions that belong strictly to private enterprise. More and more, the octopus of Government is getting a strangle hold on individual initiative and incentive, which, it must not be forgotten, has meant more in the development of the professions and industries of this nation than any other single agency. It is notorious that whenever government assumes control of any industrial or commercial activity, such as the taking over of the railroads at the time of the war, the result has usually been inefficiency and gross extravagance.

The latest development in this regard as far as our profession is concerned has to do with the growth of medical and dental service in the Government veterans' hospitals, to which attention is called in these two papers.

Let it be said at the outset that no patriotic American citizen will ever demur in the slightest degree at taking adequate professional care of any veteran who has received injuries while in the service of his country. Nothing in reason is too good for such a man, in hospital or in any other service. As Lincoln said in a slightly different relation, such a man is entitled to the "last full measure of devotion," and no government worthy the name will

ever permit him to be ignored or neglected in any degree. Hats off to the worthy veterans who rallied to the support of the Government in the hour of its need.

But what shall we say of another type of man, who did nothing for his country during the war or at any other time, but who today is seeking aid of every kind without the least warrant or justification? Feeding at the public crib is rapidly becoming the great American sport, and unless a stop is put to the unwarranted appropriations, the taxpayers will soon be staggering under an additional load that they simply cannot or will not carry.

Study the figures in the two papers under consideration and note the extreme to which this pernicious tendency is being carried. There is no justification whatever for the mounting costs of government as illustrated in the statistics presented. Literally hundreds of men are accepting government aid who never served in the line or never served at all. There has been a sad breakdown of moral conscience on the part of many of the applicants, and the whole situation is in every way demoralizing.

The professions of medicine and dentistry must be increasingly alert as to the evils that are springing up. The moment that government presumes to interfere with the prerogatives that legitimately belong to the individual, or, in short, the moment that government undertakes to perform professional services or dictate professional policies at the expense of the people, that moment there arise two abuses, inefficiency in administration and the wildest extravagance and waste.

Nowhere has the impulse of generosity been manifest to a higher degree than in our Government following the war in its treatment of the returned soldier, and we might say with equal emphasis that nowhere have abuses sprung up to the same extent as a result of the unwise paternalism that has grown out of the laudable attempt on the part of the Government to do its full duty by the veterans. It is time that these abuses stop, and every honest and self-respecting man, veteran or civilian, should do his utmost to curb the unwise tendencies and stabilize the situation for the benefit of all concerned.

The time is rapidly approaching when our citizens will no longer consent to pay their hard earned money for taxes only to have the proceeds squandered by supporting enterprises that are in no way equitable, logical or justifiable. "Hands off the public crib" should be the immediate slogan of the future.

THE ETHICS OF PUBLICATION

Again and again, the admonition has gone forth that when an author submits an article for publication, he shall refrain from offering it to more than one periodical unless it is a mere announcement of some important event of universal interest that requires the widest distribution as an item of news.

This is so generally understood that it is rare for a writer of an article on a professional topic to submit his manuscript to more than one periodical at a time. Years ago, a certain author did this with a half a dozen dental journals without the least intimation that he was sending the manuscript to more than one. The result was that several dental journals, in perfect faith, published the article simultaneously, and thus the author achieved his object of securing a wide distribution, much, in all likelihood, to his great inward satisfaction. But the aftermath was this, that no reputable journal would ever accept another article from him and he at once faded out of the professional picture and was never heard from again.

There is a question of ethics involved in the publication of papers as well as in professional practice, and every contributor should recognize this when he submits papers for presentation in a dental journal. Some journals do not reproduce articles that have appeared in print, while others with equal equity copy from other periodicals with the tacit understanding that due credit is invariably given to the journal in which the article originally appears.

THE JOURNAL is one of those that never reprint articles in their pages, and this is so generally known that articles are seldom sub-

mitted to other periodicals when they are intended for THE JOURNAL. But there is a growing tendency of late toward carelessness in this regard, and we have been subjected in several instances to needless expense and disappointment by the publication in other periodicals of papers that belonged to THE JOURNAL without any intimation that they were to be thus used. In at least two instances, the authors have permitted us to edit their articles and have them set in type and have even O.K.ed proof on them without any intimation that they were to appear elsewhere. By the merest chance, these articles were discovered in other publications just as we were ready to put them in page form. In neither of these cases is it likely that the authors intended any wrong, because we happen to know that they are honorable men and probably were not aware that their papers were to appear in other publications, but there is surely carelessness some place, which has resulted in considerable expense to THE JOURNAL and much unnecessary and useless work in preparing the papers.

We repeat: There is an ethical aspect governing the publication of articles in a professional periodical that should be just as binding as the ethics that obtain in other phases of professional life, and before any author submits a paper, he should make sure of his ethical right to do so.

THE DRIVE FOR MEMBERSHIP

At the meeting of the American Dental Association in Buffalo, Sept. 12-16, 1932, a plan was adopted by the House of Delegates to "increase and maintain the numerical membership of the Association and its constituent state societies."

The essentials of the plan were to inaugurate an annual membership contest by offering a cash prize of one thousand dollars to the successful state society under regulations prescribed by a standing committee appointed for this purpose.

The details of this plan are outlined on another page of this

issue. The names of the present standing committee are as follows:

John Scholten, Cedar Rapids, Iowa
C. B. Warner, Biloxi, Miss.
Fred Miller, Altoona, Pa.
Harry B. Pinney, Chicago, Ill., *Secretary*
Albert R. Ross, Lafayette, Ind., *Chairman.*

HATS OFF TO DOCTOR DOUGLAS

The November number of *The Bulletin of the Indiana State Dental Association* very appropriately features the beginning of a series of articles on "A Short History of the American Dental Association," which will run through the winter months.

The editor of the Indiana state bulletin is Rex N. Douglas, of Elkhart, and to him should be given the commendation of the officers and members for a very worthy piece of work. It is doubtful that many of our present members are familiar with the history of our organization, and it was a very happy conception that impelled Dr. Douglas to inaugurate this series. We predict that the articles will make a strong appeal not only to the members of the Indiana State Dental Association but also to the parent organization as a whole through the medium of reproduction by other state publications. Our thanks are hereby tendered to the author of these articles.

PUT IT ON RECORD

There is little to be gained by the evolution of a new idea or a new principle of thought unless the idea is made a matter of record. What matters it if some brilliant individual conceives a really constructive thought and keeps it to himself? For one man to know a thing avails very little in the general scheme of the universe unless other men are permitted to share the knowledge and make it available through the medium of records. And even

if a man shall have a new idea, there is only one way to make sure that the idea will be preserved, and that is through recording it. Men have been known to forget an idea, even a brilliant idea. The mind plays strange tricks at times and the greatest minds are subject to occasional lapses that leave certain blank places in the most unaccountable way. Thus an idea may be lost, as many doubtless have been. The only certain way of preserving ideas is to put them on record where they may be available for other people and for all time.

WILLIAM RICE, D.D.S., D.M.D., Sc.D.

(1867-1932)

William Rice, for sixteen years dean of Tufts College Dental School, died Nov. 23, 1932; aged 65.

His birthplace was Dublin, N.H., and the date of his birth Sept. 4, 1867. He was the son of George Matthias and Persis Fayette (Weeks) Rice.

Dr. Rice received the degree of doctor of dental surgery from Boston Dental College in 1883; the degree of doctor of dental medicine from Tufts College Dental School in 1905, and the honorary degree of doctor of science from Tufts in 1929. He entered practice in Boston in 1888. In 1900, he was appointed instructor in clinical dentistry at Tufts College Dental School, continuing in this capacity until 1911, when he was made assistant professor. In 1913, he became professor of operative dentistry, continuing in this position until he was made dean, three years later.

Dr. Rice held membership in the following organizations: American Dental Association, American College of Dentists, American Academy of Dental Science (president, 1918), New England Dental Society (president, 1926), Massachusetts Dental Society (president, 1922), Dental Hygiene Council of Massachusetts (president, 1919-1922), Dental Advisory Board of Massachusetts Department of Public Health, International Association for Dental Research (treasurer, 1927-1932), and Psi Omega Fraternity. He was also a member of the University and Twentieth Century clubs.

Chapters on dental hygiene and oral prophylaxis in Turner's "Hygiene—General and Dental" were contributed by Dr. Rice, who was also the author of other contributions to dental literature.

The widow, Mrs. Alice Bates Rice, and one daughter, Mrs. Persis Alden Rice Green, survive.

COUNCIL ON DENTAL THERAPEUTICS

ACCEPTED DENTAL REMEDIES

The following articles have been accepted as conforming to the rules of the Council on Dental Therapeutics of the American Dental Association for inclusion in the list of Accepted Dental Remedies. The Council desires dentists to understand that the admission of an article does not imply a recommendation. A copy of the rules which govern the Council in the consideration of articles will be sent on request.

SAMUEL M. GORDON, *Secretary.*

PARKE-DAVIS HALIVER OIL WITH VIOSTEROL—250 D.—Halibut Liver Oil with Viosterol 250-D.—Halibut liver oil adjusted by addition of maize oil to have a vitamin A potency of not less than 30,000 pharmacopeial units (U.S.P. X) per gram, and by the addition of a sufficient amount of viosterol in oil 250 D to assure a vitamin D potency of not less than 250 D (250 times that of the standard cod liver oil defined by the Wisconsin Alumni Research Foundation, or 3,333 units [Steenbock] per gram).

Actions and Uses: The same as those of cod liver oil. (See general article, Cod Liver Oil and Cod Liver Oil Preparations, J.A.D.A., 17:1941 [Oct.] 1930.)

Dosage: At the present time, there is no basis of dosage of vitamin A and D products where caries and tooth health are concerned. There also are no accurate data available concerning the *direct* effect of vitamins A and D in the prevention of caries. Animal experiments indicate that vitamins A and D may be factors in the proper calcification of the teeth. Until more definite data are available, the dosage which follows, based on prophylaxis against rickets, is given: For infants, from 8 to 10 drops (3 to 3.5 minims) daily; for premature and rapidly growing infants, 15 drops (5.25 minims) daily; for adults, especially nursing and expectant mothers, 20 drops (7 minims) or more daily. The marketed preparation is accompanied by a special dropper designed to deliver approximately 3 drops to the minim.

Manufactured by Parke, Davis & Company, Detroit. U. S. patent and trademark applied for. The viosterol in oil 250 D used is manufactured under U. S. patent 1,680,818 (Aug. 14, 1928; expires 1945) by license of the Wisconsin Alumni Research Foundation.

Soluble Gelatin Capsules Parke-Davis Haliver Oil with Viosterol—250 D, 3 minims: Each capsule contains 3 minims of haliver oil with viosterol 250 D, diluted with 3 minims of vegetable oil.

Parke-Davis haliver oil with viosterol 250 D is prepared by combining halibut liver oil, maize oil and viosterol in oil 250 D in such proportions that the finished product will have a vitamin A potency of not less than 30,000 pharmacopeial units (U.S.P. X) per gram, and a vitamin D potency of not less than 3,333 units

(Steenbock) per gram. The halibut liver oil is assayed for vitamin A by the method described in the *Journal of the American Pharmaceutical Association,* (19:616, 1930) and for vitamin D by the method of the Wisconsin Alumni Research Foundation (Viosterol, J.A.D.A., 18:1785 [Sept.] 1931). The potency of the finished product is arrived at by a calculated dilution of the previously assayed oil. Stability tests thus far reported indicate that the product will retain its potency when not exposed to extremes of light or of temperature.

PYCOPÉ TOOTH POWDER: Composition: Each 100 gm. contains sodium chlorid, 59.5 gm.; sodium bicarbonate, 19.8 gm.; magnesium carbonate, 4.9 gm.; sodium perborate, 14.9 gm.; oil of cloves, 0.3 gm.; methyl salicylate, 0.6 gm.

Claims: Pycopé is offered for whatever ability it may have to clean the surfaces of the teeth when used in conjunction with a toothbrush.

Manufacturer: Pycopé, Inc., Joplin, Mo. No U. S. Patent. U. S. trademark 203,276.

CAUSES AND TREATMENT OF SYSTEMIC REACTIONS IN LOCAL ANESTHESIA*

By M. L. TAINTER,† M.D., San Francisco, Calif.

The following article is presented as one in the Council's series on pharmacology and therapeutics.

SAMUEL M. GORDON, *Secretary.*

The use of local anesthesia has opened up a large field in surgery and dentistry by permitting extensive operative procedures which could not be carried out if the patient had to withstand the pain associated with them. Although of great value, local anesthesia is not by any means perfect, since, in eliminating the danger of pain and shock, the operator must perforce expose his patient to the danger of poisoning by the local anesthetic agent. This poisoning, although occurring to some extent in every patient, gives rise to symptoms or undesirable reactions only in the minority. It is the purpose of this paper to discuss briefly the cause of these reactions and what may be done to combat them.

It is a general pharmacologic rule that drugs tend first to stimulate and then to depress physiologic function. This sequence of actions may not necessarily be observable in each instance, since the phases may follow each other so rapidly as not to be separable, or they may be obscured by secondary changes. Local anesthetics are drugs which have a selective action on nerve tissue. They exhibit on this tissue the same sequence of stimulation and depression, the resulting symptoms depending on the relative duration and intensity of the two phases of action, and on the structures acted on.

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*Read before the Alumni Association of the College of Physicians and Surgeons, San Francisco, Calif., Oct. 5, 1932.

†Associate Professor of Pharmacology, Stanford University School of Medicine.

When a local anesthetic is injected into a peripheral tissue, it may first cause a painful sensation by stimulating the nerve structures. This is generally transient, since the second phase, i.e., depression or paralysis, comes on quickly. This later stage is, of course, the desirable action. The perfect local anesthetic should remain at the site of injection and should produce only these local changes. Unfortunately, no anesthetic drug is perfect, for they all are absorbed from the injected area, and distributed throughout the body, and act on remote organs and tissues. It is these remote actions which constitute the systemic reactions under discussion here.

When cocain is absorbed into the general circulation, it causes certain changes which are not seen with other local anesthetics; that is, it renders the endings of the sympathetic nerves more sensitive to stimuli than before, so that marked responses are given to previously ineffective doses of sympathetic stimulants, such as epinephrin. Since epinephrin is generally present in anesthetic mixtures, there is apt to result an abnormal degree of circulatory stimulation if cocain is used. The effects consist in general excitation, tremors, faintness, sudden rise of blood pressure, increase in pulse rate, feeling of pain or pressure over the heart and possibly throbbing in the head. The patient may be disturbed emotionally by these sensations and be difficult to control. Although the rise of blood pressure will seldom be so great as to endanger life in an otherwise healthy patient, yet, in those with cardiovascular disease, it may be dangerous or even fatal. Since no other local anesthetic has been shown to possess such sensitizing power under these conditions, this type of reaction is very easily avoided by simply not using cocain and epinephrin together.

The central nervous system, consisting of the brain, medulla and spinal cord, can be stimulated, then depressed, in any of its constituent parts by any local anesthetic. Reactions involving this system may, therefore, be conveniently divided into the stimulant and the depressant types, and each of these in turn consists of a number of responses, depending on the precise region acted on. If the higher cerebral areas are stimulated, the patient may have a feeling of apprehension, associated with various degrees of loquacity, restlessness, tremor, twitching, hallucinations or other psychic disturbances. If the medulla is involved in the stimulation, the various vital centers located in this region are acted on. Stimulation of the respiratory center will cause an increased rate and depth of respiration. Stimulation of the vasomotor or sympathetic centers will cause a rise of blood pressure, increase in pulse rate and blanching of the skin, with subjective symptoms. Stimulation of the emetic center may cause nausea and vomiting. All of these stimulant actions may occur independently of each other or may occur together, forming a symptom complex.

When the depressant or paralytic phase of a reaction is present, the results are quite different. A depression of the higher centers will cause fainting, coma or loss of consciousness, accompanied by muscular relaxation. A similar depression of the vital centers in the medulla will be dangerous to the maintenance of life itself. Depression or paralysis of the respiratory center will lead to inadequate pulmonary ventilation, the rate and depth of respiration being decreased. This may quickly lead to asphyxia and make recovery impossible. In this connection, it should not be overlooked that a severe degree of asphyxia may cause stimulation of the spinal cord and other centers, resulting in a rise of blood pressure and convulsions. These

symptoms may be erroneously interpreted as the beginning of a stimulant reaction, if the failing respiration and asphyxia have not been observed. Treatment based on such a mistaken understanding of the changes present would probably result fatally, for it would not relieve the lack of oxygen, which was threatening the patient's life.

Depression of the vasomotor and cardiac centers would result in a fall of blood pressure, slowing of the pulse, flushing or paling of the skin, general slowing down of the rate of circulation of blood and cooling of the body. This complex in the severest form results in shock or collapse, where the blood flow is so inadequate as not to maintain oxygenation of the tissues. Since the central nervous system is the tissue most sensitive to a lack of oxygen, this condition will cause further depression, and thus a vicious circle be set up which may result fatally.

When a reaction from a local anesthetic arises, events may occur so rapidly that they may be very difficult to follow. The reaction will rarely be a pure stimulation or a pure depression of an isolated organ; rather, stimulation in one or more regions will be accompanied by depression elsewhere, depending on the relative sensitivity of the various regions involved. The result is that the symptom-complex is difficult to analyze and to control under the stress of the moment. The treatment of these central reactions, therefore, has to be general, in order to maintain the vital functions and to preserve life until the organism has time to dispose of the anesthetic.

The stimulant type of reaction may best be combated by central depressants. There are a large number of these, but barbital, or any of its derivatives, seems to be the most efficient. Three-tenths gram (5 grains) of barbital or 0.05 gm. (1 grain) of phenobarbital, taken by mouth one-half hour before anesthesia is induced, will prevent the moderate reactions which commonly occur. The efficacy of these drugs depends on their depression of the midbrain, the region that the anesthetic most commonly stimulates. As the stimulant reactions are the more common, being induced mainly by the lower doses, it can be seen that the prophylactic use of barbital can add greatly to the operator's comfort and freedom from anxiety and indeed to the patient's as well. When this stimulant reaction occurs in spite of, or because of lack of, prophylactic medication, it may be necessary to resort to more energetic measures. In such circumstances, oral administration of barbital is too slow to be of immediate benefit. The antidote must, therefore, be injected. For this purpose, the practitioner may have on hand ampuls containing 0.5 gm. (7 grains) of sodium phenobarbital or sodium amytal. These may be injected intravenously or intramuscularly, and have an almost immediate effect. The dosage suggested is rather large, being almost enough to produce general anesthesia, and must therefore be used with caution.

For the depressant type of reaction, entirely different treatment must be instituted. Here, the danger to life is from paralysis of the vital centers. For depression of the respiration, such reflex stimulants as camphorated oil and ether may be tried first, but they are generally ineffective. More effective are a number of direct stimulants, of which the most important are caffein and atropin. Newer respiratory stimulants are metrazole, coramine and hexetone. These belong to the camphor groups, but their efficiency and freedom from danger in emergencies have not been demonstrated. Another such drug is alphalobelin, which may stimulate respiration, but is dangerous because it acts like nicotin. The most efficient of all respiratory treatments

is artificial respiration, supplemented with blasts of 5 per cent carbon dioxide, if necessary. This measure should be resorted to in all cases when there is any question of the adequacy of ventilation. It may be continued without difficulty or injury for several hours, a period much longer than that needed to institute recovery from the toxic action of the local anesthetic.

Depression of the circulation, when sudden and severe, must be combated by injections of ephinephrin. This drug will raise the blood pressure, increase the pulse rate and generally improve the circulation as long as there is a possibility of response. The effects of epinephrin are transient, and a sustained recovery might necessitate repeated injections at about ten to fifteen minute intervals. More prolonged in action are synephrin and neosynephrin, the latter maintaining an increased blood pressure more than an hour when a dose of 10 mg. (one-sixth grain) is injected intramuscularly. If sufficient time is available, neosynephrin may be given by mouth in a dose of from 0.2 to 0.3 gm. (from 3 to 5 grains), with the expectation of maintaining blood pressure for several hours. The use of ephedrin as a circulatory stimulant is not advisable, because, although it raises the blood pressure under some conditions, it has an undesirable depressant action on the heart which should preclude giving more than a single dose of this drug. It is much less effective if depression of the circulation is already present, which is the time when the need for a pressor drug is greatest. It also causes considerable unpleasant central nervous stimulation.

With the aid of the various measures proposed, the respiration and circulation can usually be maintained until the toxic action of the local anesthetic has been overcome and complete recovery occurs.

BUREAU OF PUBLIC RELATIONS

THE CHILDREN'S FUND OF MICHIGAN*

By K. R. GIBSON,† D.D.S., Detroit, Mich.

TAKING its place among the larger organizations and trust funds dedicated to the upbuilding and betterment of humanity, we find today a unique organization designated as the Children's Fund of Michigan. This, a benevolent and charitable trustee corporation devoted solely to the interest and welfare of children, was created April 11, 1929, by Sen. James Couzens' outright gift of ten million dollars to the children of the State of Michigan.

Two specific requirements were laid down in originating the trust fund and equal stress was placed on them. The first clearly defines the purpose of the organization. In the trust instrument, we find its purpose to be "to promote the health, welfare, happiness and development of the children of the State of Michigan primarily, and elsewhere in the world." The intention of this is unquestionable. No restrictions are placed on race, creed, color or social condition. As far as possible, the child shall be given, from prenatal existence, through infancy, childhood and adolescence, those opportunities that will make for an independent, robust, intelligent and mature life. The ultimate aim is a healthy and enlightened citizenry.

The second injunction is equally important. A definite time limit is placed on the expenditure of the money. Quoting again from the trust instrument: "The trustees shall use, disburse and expend the principal and income of said fund in its entirety within twenty-five years from and after May 1, 1929." It has been ascertained by actuarial computation that the annual disbursement of approximately $700,000 will completely use both principal and interest within the specified period of time. This manner of giving is in line with modern methods of philanthropy and avoids what the donor expressly dislikes—gifts in perpetuity. Senator Couzens' gift stands as a demonstration to coming generations. It places the responsibility for financing social obligations directly on those who, from time to time, rise to wealth, so that they may be prompted by equally generous motives to carry the public welfare progressively into the future.

Questions have frequently been asked concerning the phrase "children of the State of Michigan primarily, and elsewhere in the world." It was quite evident in the first survey of conditions that the need for work among the rural children of our own state was so great that it should come before any activity carried on elsewhere. While the children of our larger cities have long enjoyed health service, health facilities in the smaller communities and rural areas have been entirely lacking, except in isolated instances. The trustees, therefore, deemed it wise to make Michigan, a state covering 57,000 square miles,

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†Director, Dental Division.

with a population of 4,000,000, a model for the upbuilding of childhood through the use of philanthropic effort. By so doing, they will "primarily" and directly provide for the needs at their door as well as establish an intensive, effective and thoroughgoing demonstration.

When adequate demonstrations have been completed and local needs satisfied, the Children's Fund of Michigan will seek opportunities for service "elsewhere in the world."

Approximately three years have elapsed since the inception of the fund. A review of these years shows that the first year was given over largely to a study of the needs of Michigan children and the careful building of an organization which could best meet and minister to those needs. That this is the case is demonstrated by the fact that only $156,000 was actually expended of a budget of $740,000.

The beginning of the second year found actually under way many of the projects designed to better health, lessen sickness and lower death rates among children. During this second year, appropriations were made to the extent of $1,166,000, of which $871,000 was expended in service to and for children.

The third year of the fund's existence has passed into history. Service and projects outlined the first year, and experimentally operated the second year, were consolidated and brought to their maximum efficiency during the third year. During this period, appropriations to the extent of $986,000 were made, of which $885,000 was actually spent.

We are now working in the fourth year. A review of the fund's general program shows that our present activities fall into five main divisions, with major emphasis placed on the problems of child health. These divisions are as follows: child health, child guidance, research, dependency and miscellaneous relief. Only the briefest review of the work of these divisions is possible here.

CHILD HEALTH DIVISION

The program of the child health division is basically one of health education. Each activity is an attempt to educate the citizens of the areas served to a knowledge and appreciation of the importance of preventive health measures, particularly as they relate to the welfare of children. The bureaus within the child health division are those of administration, dentistry, health education and nursing.

The activities of this division may be summarized as follows:

Nursing Program.—A staff of thirty-four nurses brings to thirty-two rural counties the benefits of a generalized nursing program. Children from infancy through school age are placed under health supervision, infant and maternity service has been developed and immunization against diphtheria and smallpox is given.

The nursing program is a demonstration as well as a relief project. While fifteen members of the staff are working in unorganized areas, nineteen of our nurses are connected with organized district health units and are contributing to a community health program.

It is hoped that counties will be convinced as to the worth of a nursing program, so that they will later see fit to take over and finance their own nursing projects as a part of a larger program of public health work.

Health Education.—The children's fund furnishes a health educator to each of the four state teachers' colleges; to Marygrove College, Detroit, which trains nuns for work in the parochial

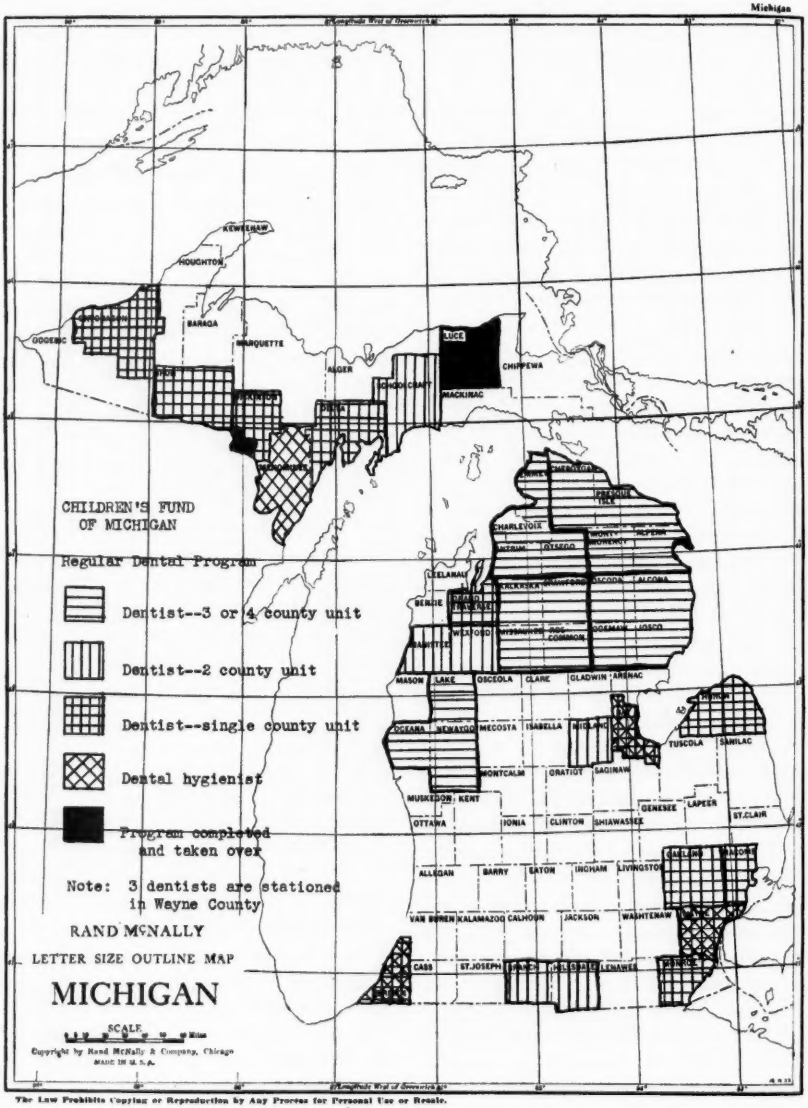

Fig. 1.—Regular dental program.

schools, and to the state department of public instruction. A health educator, directing the educational efforts of the child health program, endeavors to place educational emphasis on all phases of health work in the field.

The purpose is to give to teachers going out into Michigan's school systems essential information to use in promoting the health of school children.

Menominee County Child Health Demonstration Unit.—This unit was established to prove the value in health returns of a highly trained county health staff. The unit personnel consists of a health officer, four nurses, a dental hygienist, a sanitary inspector and a part-time laboratory technician.

Consolidated District Health Departments.—Five health department units, each with full-time personnel consisting of a health officer, a dentist, nurses, a sanitary officer and a clerk, bring to sparsely settled districts of nineteen counties the health advantages enjoyed by most urban areas.

Correction of Visual Defects.—Two women opthalmologists examine the eyes of children referred by school nurses and teachers. Special attention is paid to the preschool child who shows defects of vision. Glasses are prescribed for those in need of correction, and are given without charge to indigent children.

Infant and Prenatal Classes.—Two women physicians hold classes of instruction for mothers. They also make health examinations for infant and preschool children. In certain counties with inadequate medical facilities, this service is also given to the school child.

Northern Michigan Children's Clinic.—Because the children of the upper peninsula have had so little in the way of health facilities, the children's fund, cooperating with St. Luke's Hospital and the postgraduate department of the University of Michigan Medical School, erected a clinic building and is now maintaining a diagnostic service at Marquette. Through this clinic, pediatric service is made available to the children of the upper peninsula, and postgraduate instruction to the medical men of the area. The clinic also acts as a diagnostic center and clearing house for the University Hospital.

Children's Hospital, Detroit, Dental Clinic.—A dental clinic is maintained at the Children's Hospital, Detroit, where orthodontic and other dental treatment is rendered both inpatients and outpatients of the institution.

CHILD GUIDANCE DIVISION

Unlike the work of the child health division, in which the main efforts are directed toward the physical well-being of children, with a program which is essentially rural in character, the work of the child guidance division has to do with the social and mental adjustment of children, and is metropolitan in character.

A building in Detroit, adjacent to one of the large hospitals, has been remodeled and equipped as a child guidance clinic. To this center are brought children whose conduct is a source of irritation and trouble to parents, teachers and neighbors. Here, psychiatric, psychologic and physical examinations are made, and patient effort is directed by a skilled staff toward a readjustment of the child's life.

In four elementary schools and two high schools in Detroit, a mental hygiene program is also carried on. The objective is to seek out the younger children in the lower grades whose conduct indicates that they are misfits at present in the school environment, or are in danger of becoming such.

Grants have likewise been made to two additional cities to augment the local programs in the field of child guidance.

RESEARCH

The third major division of the Chil-

dren's Fund activities falls within the field of research.

Research Laboratory.—Of particular interest is the work being carried on in the research laboratory of the children's fund, which, together with the medical staff of the Children's Hospital of Michigan, is developing a research center. Here, studies in the field of maternal and child nutrition are going forward.

Other Research. — Research grants have been made to the University of Michigan Dental School, where inquiry is being made into the causes of dental caries. Other grants have been made to promote the studies of orthodontic problems and of childhood tuberculosis. The fund is financing a clinic in Detroit as a unit of the Yale Institute of Human Relations for research in juvenile delinquency.

DEPENDENCY

The present economic depression has caused widespread suffering in the Detroit metropolitan area. To assist in the emergency, the children's fund has spent approximately $90,000 to feed and clothe children. For its work in the upper peninsula, the Michigan Children's Aid Society was given a substantial sum to assist in the work of caring for dependent and neglected children.

MISCELLANEOUS RELIEF

Miscellaneous grants range from assistance in the establishment of camps for crippled and undernourished children to a grant for the education of the Negro social worker.

DENTAL PROGRAM

Conditions of dental neglect among children, found in all communities and states in varying degrees, were early recognized as being true in Michigan. Even among the children of the more prosperous sections of the state, inspections have shown a decided need for dental corrections and preventive dental education.

To meet this need, one of the first steps taken was the organization of a dental division and the placing of a dental program in the field.

Nov. 25, 1929, the first dentist was employed. Since that date, dental educational and correctional work has become the largest single unit of children's fund activities. A field staff of twenty-two dentists and four oral hygienists operates a year-round educational program for all children and a correctional program for the indigent children of thirty-eight rural counties and two metropolitan areas. This is the regular dental program.

In addition, a special dental project is carried out over a three-month period each summer. A staff of twenty dentists is employed and a program limited to the correction of dental defects of indigent children is carried out in twenty counties not reached by the regular program. This project is known as the summer dental relief program.

Objectives of the Dental Program.—In any endeavor which involves the expenditure of a considerable sum of money, certain well-defined objectives are necessary if definite progress is to be made and waste effort avoided and results are to be accurately measured.

With these considerations in mind, the dental project was directed toward certain ends, namely:

1. The education of local authorities to the necessity for public health programs, including dental education programs for all children and preventive and corrective dental programs for indigent children.

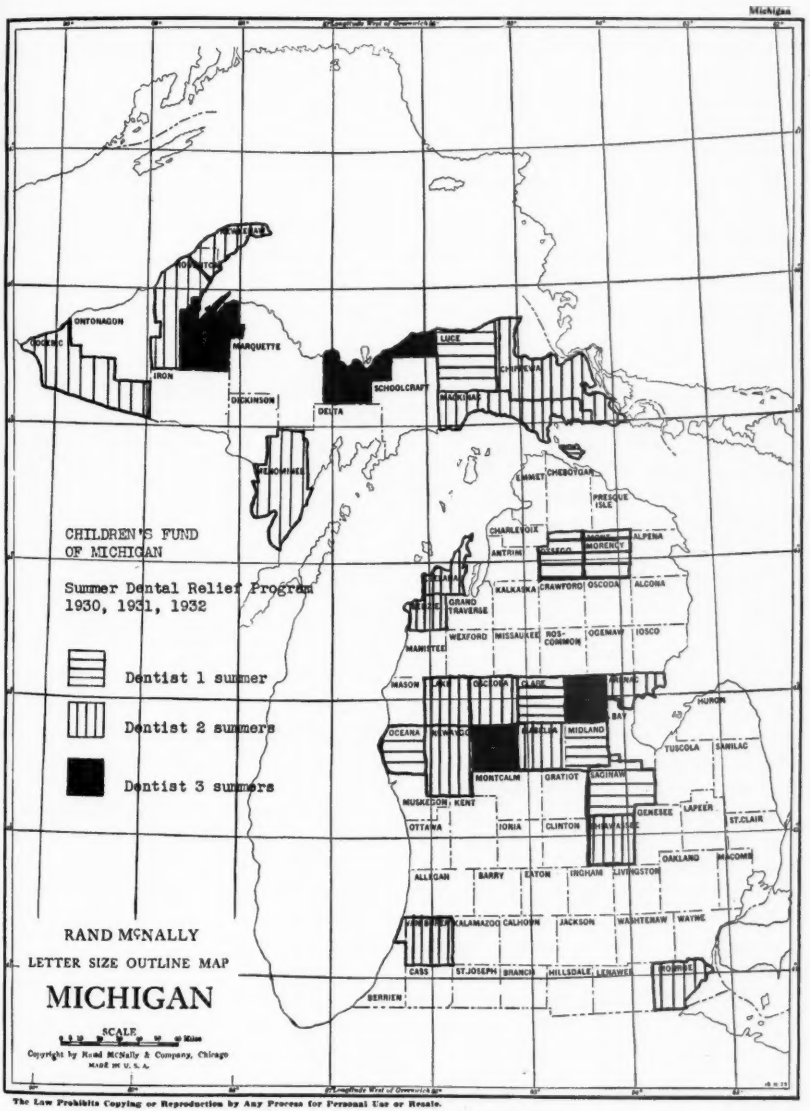

Fig. 2.—Summer dental relief program.

2. The education of parents and children to the importance of dental health, correct diet and the necessity of frequent dental examinations.

3. To strive to interest all groups concerned, especially public health

nurses, school superintendents, teachers and dentists, in matters of public health.

4. To bring about as large a number of dental corrections as possible by referring those able to pay to the family dentist, and by the establishment of free dental clinics to care for children otherwise unable to receive dental treatment.

Conditions Incident to a Regular Dental Program.—Though petitions have been received from all counties in the state, and though the program is functioning in more than half of these counties, it must not be thought that the dental program has been or can be extended to every county applying for service. Two conditions prevent: Other projects than a dental program are necessary in a well-rounded health program, and not all counties can or will meet the stated requirements.

Before establishing a dental program in a county, it is necessary that the county meet certain conditions: 1. It must employ regularly a county, city or school nurse. 2. It must provide, without cost to the fund, suitable operating space. 3. It must organize a county dental advisory committee.

There are valid reasons for imposing these conditions. It is required that the county regularly employ a county, city or school nurse because it is felt that we would be working in an unfertile field were the county not sufficiently advanced in health appreciation to be willing to spend a small portion of its own money in a health program. Again the county nurse is in a most favored position to further our educational efforts.

Suitable operating space is defined as a room or rooms well provided with natural light and electricity, heated when necessary and so situated as to be available to the greatest number of children. Running water and cupboard space are desirable. Daily janitor service for the operating room must be provided without cost to the fund.

Operating space can, in almost all instances, be furnished in a school building without expense to the county, and it is only through the close cooperation of the school authorities that a dental program can be operated at maximum efficiency the year round.

Not of the least importance is the county dental advisory committee. Such a committee, made up of the more responsible citizens of the county, is in the best position to advise and cooperate with the home office and with the dentist sent. Again, on completion of the demonstration, it is the group on which we must depend to see that the work is carried forward.

These committees are composed of such representative citizens as the county commissioner of schools, superintendent of schools, judge of probate court, county poor commissioner, county agricultural agent, P.T.A. presidents, clergymen from local churches, heads of civic organizations and clubs, physicians, dentists, nurses and leading business men.

The county having met these requirements, the children's fund operates the dental project without expense to the county, furnishing the dentist's salary, complete equipment and all necessary supplies.

Character of the Dental Program.—Having determined the objectives and conditions under which the program should operate, consideration was next given the character which it should assume to approach these objectives.

Owing to the fact that certain counties in the north central portion of the lower peninsula may never be in a position to finance any health program, it

was recognized that the dental project in these areas must through necessity be operated purely as a relief project. Most counties have adequate finances for health programs in normal times, and they would, we believe, be interested in maintaining such projects if sufficient proof of the beneficial results were shown.

Therefore, while the dental project is operated on a relief basis entirely in certain counties, in the majority of cases it assumes a demonstrational as well as relief character.

Educational and Operative Sides to the Dental Program.—Outside of any consideration as to what the project may mean to county or city authorities, the dental program embraces two phases or sides in its operation, namely, the educational and operative sides.

The educational dental program: In all counties, the necessity of carrying on dental education in conjuction with the operative program has been stressed. It is expected that each dentist and dental hygienist will spend ten working hours a month in educational work; and should the evening meetings be counted, the time expended would be greatly increased.

Material has been prepared for the use of teachers and pupils; graded classroom talks are given; the use of dental movies in school rooms is encouraged, and lectures are given to lay and professional groups.

Of particular value in stimulating interest in dental health among children have been the county-wide essay and poster contests carried on with the active cooperation of the school authorities. These contests are graded to suit the age and intelligence of the children participating. Awards are made by service clubs or other public-spirited organizations, and are usually presented by the county commissioner or superintendent of schools.

Open house evening clinic meetings have been arranged in certain counties, to which parents are invited. Actual operative treatment is rendered children, and comparison is made between completed groups and those badly in need of dental treatment. These clinic meetings present a splendid opportunity for educational endeavor.

While the aforementioned type of formal educational effort is of real value, that which is most significant is the effect produced in whole communities by active participation of local committees and local people in a public health program. By sharing in the work of securing dental treatment for children, they receive an education which no amount of lecture work could give.

The operative dental program: The operative side of the dental program is an attempt to bring dental health to underprivileged children through operative procedure. When the project was first initiated, it was hoped to give dental examination and prophylaxis to every child in a county, to refer children who could afford to pay for treatment to the family dentist and to admit indigent children to the clinics for treatment.

In normal times, we would favor the county-wide examination and prophylaxis idea. These procedures do much to impress on the minds of children and parents the value of a clean healthy mouth, to introduce children to the dental chair under favorable conditions and to encourage children who cannot be classed as indigent to go to the family dentist.

The present economic situation in Michigan has so raised the percentage of indigent that it is a waste of time and effort to make dental examinations

for thousands of children who cannot possibly hope to secure dental treatment except in free dental clinics. Even with all the follow-up work that we were able to do in 1931-1932, only 8 per cent of the children referred to the family dentist actually received treatment.

Dental examinations this year, then, will be made for only such numbers of children as will keep our clinics busy. To all those examined, prophylatic care will be given. Children judged able to pay for dental treatment will be referred to their local dentists, and indigent children will receive free dental treatment in our clinics.

Establishment of a Clinic.—Once it has been decided to extend a dental program to a given county on request of a responsible group of people, the following steps are taken to establish the clinic and get it under way.

After location of the dental clinic is determined and the equipment is set up in a school room, classroom lists are prepared of the children in the school area to be served. These are checked for eligibility, and indigency is attested by two local agencies, such as teachers, public health nurses, probate judges, poor commissioners, supervisors, physicians and dentists. Eligibility lists are also checked by individual local dentists or a committee of dentists. We want in our clinics no child whose parents can afford to pay for dental treatment.

When the eligibility lists are prepared, the district is ready for a preliminary dental examination. This examination, which is made with mouth mirror and sharp explorer, and which is given to all children of the area, is only to determine which children require dental treatment. Those needing operative treatment for which they are able to pay are referred to the family dentist; while those not able to pay, as attested by the classroom eligibility lists, are given an appointment for our dental clinic. Before treatment is initiated, the parent's written consent is of course secured.

It is desired to complete dental treatment for every child receiving service. Children whose work is completed are reported back to the school nurse or teacher through a simple reporting system, whether such treatment is effected by the family or a clinic dentist.

The child's name is then placed on a classroom honor roll, and when a sufficient number in any room are recorded, a dental honor pin is presented in a classroom ceremony to each child attaining dental health. When a whole school attains 100 per cent dental health, the school receives a dental health banner. In many instances, a half holiday is awarded by the school authorities.

Operative Treatment. — Operative treatment in the clinics consists of all forms of dental treatment except the construction of dentures, bridges, inlays, gold and porcelain fillings and crowns and orthodontic work. These are manifestly impossible, owing to the large number of children requiring preventive dental treatment. A child requiring such special treatment may secure it through a system whereby the family dentist renders the treatment and the children's fund pays the bill.

Character of Operative Treatment.—Much criticism has been directed in the past toward the character of operative treatment rendered in school dental clinics. Undoubtedly, much of this has been deserved, but it is as absurd to condemn all dental treatment rendered in school programs as it would be to condemn all dental treatment rendered in private practice. Good and poor dental treatment are found in both.

The character of dental treatment rendered in either private practice or in school dental clinics is dependent on the skill and honesty of the operator and the conditions under which he must work.

Adequate remuneration will attract men of honesty and skill to the field of public health dentistry. Given in addition comparable conditions under which to operate, specially designed and manufactured equipment, all needed supplies, and a limited number of appointments, there is no reason to suppose that the character of treatment given in school clinics cannot equal that rendered in private practice.

Treatment given in the children's fund dental clinics is the best each dentist can perform. Adequate remuneration and decent conditions under which to work insure the high type of dental personnel.

A minimum of twelve and a maximum of fourteen patients, emergency cases excepted, are seen daily. Appointments are for one half hour each, and the operating day is six hours. Five and a half days constitute the operating week.

Accomplishments of the Dental Program.—What means shall we use to evaluate the dental program? What yardstick may we employ to determine its success or failure?

The main task of a foundation is not to satisfy existing social appetites, but to stimulate new ones. It must prove to communities that certain programs are not only desirable but also feasible. It should prime the pump of local resources in order that these programs may be maintained by local communities. Using these as units of measure, we feel that to date we have been reasonably successful, for:

1. One county (Luce) and two communities (Iron Mountain and Breitung Township) have made provision for carrying on the dental program under local financing and are now operating their own dental clinics. This, we feel, is an excellent record, since the take-over was made during a period of depression, when most counties and cities were curtailing rather than expanding service.

2. The dental project has been the direct means of saving the office of county nurse in three counties.

3. It has been the direct cause for the employment of a county nurse or dental health educator in six additional counties.

4. The members of the dental advisory committees have been educated through contact with the dental program, and have spread information and interest to many people within their counties who would not otherwise have had an opportunity to learn the value of public health services.

5. It has stimulated the interest of the dental profession.

6. It has rendered educational and relief service to children as follows: (from Feb. 17, 1930, to Aug. 1, 1932)

Patients given treatment	54,472
Patients referred to family dentist	54,315
Clinic visits	129,746
Prophylactic treatments	67,536
Teeth extracted	108,066
Fillings inserted	159,350
Dental health talks given	5,681
Attendance at talks	181,114

Through the three years of its operation, the dental project has had the whole-hearted cooperation of the dental profession of Michigan and its educational authorities. We shall endeavor to so conduct our program in the future that this interest and cooperation may continue unabated.

SURVEY OF SCHOOLS FOR DENTAL HYGIENISTS

By GEORGE H. WANDEL, D.D.S.

Name of School	Year Founded	Length of Course*	Graduates to Date Dec. 1, '33	Graduates '30-'31	Graduates '31-'32
Temple University	1923	1 academic year	161	23	38
University of Minnesota	1920	2 academic years	220	20	20
Forsyth Training School	1916	11 months	760	49	40
University of Tennessee	1925	2 academic years	25	7	5
University of Pennsylvania	1921	1 academic year	418	34	50
Georgetown University	1930	1 academic year	31	10	18
University of Michigan	1921	1 academic year	179	17	8
Columbia University	1916	1 academic year	786	53	56
University of Southern California	1928	2 academic years	25	7	9
University of California	1918	2 academic years	87	6	15
North Pacific College of Oregon	1929	2 academic years	7	2	1
Kansas City Western Dental College	1929	1 academic year	22	9	9
Rochester Dental Dispensary	1916	1 academic year	932	64	78
Marquette University	1923	1 academic year	163	20	31
Northwestern University	1922	1 academic year	173	25	26
Murray-Leonie Guggenheim Clinic	1932	1 academic year	..	..	..
Robin Adair School†	1928	1 academic year	51	17	18

*It is of interest that a number of the schools are contemplating changes in the length of their course. Several are considering raising their entrance requirements and others are making important changes in their curriculums.

†The Robin Adair School was discontinued in June, 1932.

CURRENT LITERATURE

EXTRACTS AND ABSTRACTS

Calcium and Phosphorus of Saliva in Relation to Dental Caries: In an effort to secure more data on the saliva in relation to caries and at the same time to determine whether there would be changes in tooth condition following slight dietary improvement and such changes would be reflected in the salivary calcium and phosphorus, Hubbell and Bunting (*J. Nutrition,* November, 1932) studied the saliva of school children from 7 to 16 years of age. The subjects were divided into five groups: 1. Children (twenty-five in number) with active caries, who were given in addition to the home diet 1 quart of milk, 2 ounces of tomato juice and 8 drops of viosterol. 2. Children (twenty-five) who had active caries, and who were given in addition to the home diet 1 quart of milk and 2 ounces of tomato juice. 3. A control group of thirty children with active caries, whose home diet was not supplemented. 4. A control group of ten children with no active caries and in most cases no fillings, whose diet was supplemented as was that of Group 1. 5. Twelve children with no active caries and in most cases no fillings, used as a control group and receiving no supplementary diet. Dental examinations were made at the beginning and the end of the experiment and twice during the period. At least eight determinations were made for each child. The specimens were analyzed for total solids, ash, calcium and phosphorus. The authors found no relation evident between calcium and phosphorus content of the saliva and the occurrence of dental caries. When the diet was supplemented by the daily addition of 1 quart of milk and 2 ounces of tomato juice, with or without viosterol, there was a slight tendency toward a decrease in the incidence of dental caries. This improvement in tooth condition was not accompanied by any consistent change in the salivary calcium and phosphorus. The authors conclude that volume of saliva secreted in a unit time is to be considered in interpreting salivary analyses. They say: "If we calculate the total amount of salivary calcium and phosphorus per minute for each group, we find that those with the more rapid flow secrete about three times as much as the slower. When the calcium and phosphorus are expressed in mg. per 100 cc. of saliva, much higher values are reported for those individuals with the slower rate of secretion. If the saliva is a possible factor in the determination of immunity of susceptibility to caries, it seems as if one should consider not only the relative amounts of the constituents as expressed in the usual way, but should take into account as well the total amount of material available at a given time. At present we can make no satisfactory correlation between rate of flow and tooth preservation, although there appears to be a slight tendency for the caries-free individuals to secrete larger volumes than is the case of those with active caries."

Hemophilia: Report of a study of thirty-five persons having hemophilia is made by Carrol LaFleur Birch (*J. A. M. A.,* Nov. 5, 1932). The patients ranged from earliest infancy to 52 years of age. Twenty-eight gave a definite family history of hemophilia; seven were unable to trace a hemophiliac strain. Analysis of charts compiled by the author reveals that children of transmitters of hemophilia are predominantly male (63 per cent). Of the male offspring of transmitters, 71 per cent had hemophilia. Of the transmitters' daughters, 38 transmitted hemophilia, 51 per cent had no children and 1 per cent had only daughters, while less than 10 per cent bore at least one normal son and no sons with hemophilia. Thus, a transmitter has an almost 2:1 chance of having sons instead of daughters, and these sons have a 2:1 chance of having hemophilia. In the families studied, only a few of the hemophiliacs had children, owing chiefly to the

high mortality. It is said that 54 per cent die before the fifth year and 89 per cent before the twentieth year. The children are more likely to be females. No male offspring had hemophilia and none transmitted it. Of the daughters, 46 per cent transmitted the condition, 43 per cent had no children, 4 per cent had only daughters and only 7 per cent had at least one normal son and no sons with hemophilia. The author comments that Nature seems to have provided that this disease shall go on forever, because the transmitters have more sons than daughters, while hemophiliacs have more daughters than sons. Hemophiliacs and transmitters seem to have families a little above the average in size. In the author's cases, ovarian therapy has been employed for more than six months. Nine of the patients showed a good response and nine showed definite though less marked improvement, while the condition of one remained unchanged. The response was both general and specific. The general improvement was shown by an increase in weight, hemoglobin and vitality. The specific response was shown by a decrease in number and severity of the hemorrhages and a lowering of the coagulation time. The author concludes that the prolongation of the coagulation time in hemophilia is due to increase in the resistance of the blood platelets, for when this resistance is overcome mechanically, the blood clots in normal time. When certain ovarian preparations are added to hemophiliac blood in a test tube, the coagulation time is decreased to one-fourth or one-half the time of the untouched control.

Depressed Fractures of the Zygoma: Fracture of the zygoma, which occurs chiefly through the temporal, frontal or orbital processes, the body of the bone then being depressed, is in virtually all cases, according to F. S. Balyeat *(California & West. Med.,* November, 1932), due to trauma such as automobile or airplane accidents, fist-fights or falls. The chief signs are flatness of the cheek eminence, often anesthesia of the upper lip, trismus due to pressure on the coronoid process or the mandible, bleeding from the nose if injury to the antrum has occurred and sometimes, when the arch is broken, the presence of distinct dimpling. Roentgenograms are of great value, especially if there is much swelling. Excellent results can be obtained from the following procedure, if carried out early enough: An incision 2 cm. long is made in the bucco-alveolar fold above the upper last two molars, and, by blunt dissection, a flat, broad elevator is placed beneath the beginning of the temporal arch and the bone raised upward and outward. Iodoform gauze is used for drainage and if packed rather tightly may aid in holding the bone in its new position. In some cases, it may be necessary to enter the antrum by way of the canine fossa and then raise the bone. External operation, alone or in combination with the intra-oral, is done in many cases. A commonly used procedure is as follows: A screw porte is forced through the skin into the outer surface of the bone and the fracture reduced by upward and outward elevation; or an instrument shaped like a large heavy towel clip forceps, one blade being placed on the orbital process and the other through the skin into the outer surface of the bone, and the bone raised to place. For depressions of the arch, some make an incision along the border of the arch and raise the depressed process by use of blunt elevators. At times, an aneurysm needle can be passed around the beginning of the arch and the fracture reduced.

Dental Disease and Digestive Disorder: Of great importance is the infection of the digestive tract by organisms carried in the blood-stream from closed foci of infection about the teeth, a subject that brings me to the problem of focal sepsis in its relationship to gastro-intestinal disorders. The effective field is narrowed down here to two or three situations where organisms, notably streptococci, are prone to localize. These are the stomach and the duodenum, particularly in relation to peptic ulcer, the gall-bladder and the appendix, a trinity which accounts for a very large number of all cases of dyspepsia. With the general thesis of focal infection I am not here concerned. It is a theory of respectable antiquity, but it is only within quite modern times that it has been accepted as a great principle of infection. I would, however, remind you that no organism which remotely fulfils Koch's postulates has been isolated in these infections and in spite of much painstaking research into the typing of streptococci, blood cultivation, animal inoculations, agglutination tests, complement fixation and intracutaneous tests for sensitization, we have to confess that the method of trial and error is frequently the only one by which the relationship of the

focus to the disease can be determined. A recital of cases which have been cured by the removal of a septic focus is always impressive and at times dramatic. Less dramatic but even more impressive would be a recital of cases in which no improvement had taken place. In disorders of the gastro-intestinal system, dramatic results are rarely in evidence, probably due to the usually chronic nature of the diseases in question and to the establishment of subinfections which may ultimately act as foci themselves and remain uninfluenced by treatment of the original oral condition. Nevertheless, a body of valuable clinical evidence is steadily accumulating to show the close relationship of some of these conditions to focal sepsis and the importance in treatment of a preliminary attention to possible sources of infection.—T. L. Hardy, in *Birmingham M. Rev.,* September, 1932.

Surgical Vision: No one could for a moment justly disparage the value of experimentation. It has led to innumerable discoveries, to the correction of serious inaccuracies, to the saving of lives. Yet certain types of research have gone up blind alleys for lack of purpose, for lack of a compelling aim, for lack of vision. There is wanted as much wisdom to see the irresistible demand for instituting a research problem as there is to conduct the experiments and interpret their findings. The fetish of statistics has done much to confuse the pictures presented in surgical research. A parade of animal experiments, a row of figures and tables, together with elaborate conclusions, may mean a great deal or nothing at all, subject to the character, the environment and the material of the individual investigator, and, further, to the proper analysis of reported statistics themselves. May not one intelligent man's conscientious opinion be of parallel value? May not vision be needed as a control factor in experiment? We hug to our bosoms the research worker in surgery who is possessed by an idea, whether it be simply a hypothesis or an actual issue, and who follows it through with unerring faith to the end, but we deprecate the trumping up of a meaningless problem only to exploit a theme which had better remain unsung, or to prove a point which needed no proof. Let us recall the earliest announcement of Hippocrates concerning surgical research: phenomena first, then judgment, then general propositions, then practical knowledge and craft. If, then, surgical vision derives its impulse from a conception of past, present and future, there is room for its fulfilment in surgical practice. There are three essential ingredients in the make-up of the surgeon—the mental, the moral and the mechanical. The first has to do with knowledge, the second with judgment and the third with skill. In such order they provide the why, the whether and the how of every surgical question. A well rounded surgeon recognizes this trinity of attributes and happy indeed is he—and rare in the extreme—who may possess them all in equal degree.—Hubert A. Royster, in *J. A. M. A.* July 9, 1932.

Diathermy in Dentistry: The following is the technic of sterilization of root canals with putrid contents: broad opening of the cavity and canal entrances, with use of the cofferdam. After sterilization with alcohol and tincture of iodine, the cavity and the canals (the latter with a fine needle) are filled with hypochlorite. The inactive electrode is now placed in the patient's hand, whereas the active, a Miller needle, is introduced into the canal. The patient is told to lift his free hand just as soon as he feels any pain. A current of about 60 milliamperes is then turned on and the tip of the needle is moved back and forth in the upper third of the canal for two to three seconds (not longer). To cool off the tooth, the current is then turned off for about eight to ten seconds even if the patient has felt nothing, and then allowed to act for two to three seconds on the middle third of the canal at a strength of 70 milliamperes. After a new intermission of eight to ten seconds, the needle electrode is pushed as deep into the canal as it will go without force and the current kept on till the patient begins to react. The current is then immediately turned off and hypochlorite removed, the canals are widened and refilled with hypochlorite, and the whole procedure is repeated once or twice more, but with the addition of chloramine powder. Strict care should be taken to prevent the flow of liquid from the cavity to the gums while the current is turned on, because if this happens the current is diverted to the gums instead of going into the canal. The canals are then dried by means of sterile paper tips and then diathermy (50 milliamperes for one to two seconds) employed. A compact filling should then be immediately inserted into the roots.

There is usually no reaction whatsoever. The procedure must sometimes be repeated two or three times on the following day. If there was severe pain or a great deal of purulent flow from the root canal or a very putrid odor, only a temporary filling should be made. During the diathermy, the temperature in the root canal rises to 131 degrees F. and even higher; at 122 degrees F., all bacteria are destroyed and, in addition, the effectiveness of the hypochlorite plus the chloramine and of their gaseous derivative (chlorine in *statu nascendi)* is increased twenty fold under the influence of the heat. An inflamed or exposed pulp can be removed after the introduction of arsenic pads or after anesthesia by injection. The pulp cavity is opened wide, the current allowed to act for one or two seconds (not longer, or the pulp will be boiled to pieces and become crumbly) at 60 milliamperes on the one or more canals. Repetition is not safe before eight to ten seconds, as otherwise there is danger of burns, even though the patient reports no pain. If there should be a burn on the gums, dab it with an 8 per cent zinc chloride solution; if there is a slight secretion from the root canal (rare), a sterile cotton or paper thread should be placed in the canal every second day and shut in by means of a Fletscher.—Inflamed tissue is so diathermized with two lead electrodes placed opposite each other that the patient experiences a slight warmth. The electrodes should not be removed till the current has been turned off.—In dental surgery, the current is increased to about 200 milliamperes. Then, with a fine wire snare, the tissue can be cut through without hemorrhage, as if with a sharp knife.—H. J. Mamlok, in *Ars Medici.*

Possible Cause of Explosions in Gas Anesthetic Devices: Recently a harmless explosion occurred here which well illustrates a possibility about which I have spoken before; namely, that flushing the anesthesia machine with oxygen rather than with nitrous oxide, before all the ethylene and ether have been removed, may lead to an explosion. The anesthetist had been giving ethylene and oxygen. After the operation was finished, the machine was shoved into a corner. The anesthetist then emptied the bag by bringing pressure to bear on it with her hand, and then flushed the machine with oxygen. She tried to take the inhaler tubing from the machine, and there resulted a quick explosion. This occurred even though our anesthetists have been warned repeatedly against this particular procedure. The enclosed print shows the hole that was made in the breathing tube. In some way or other the ground wire had become disconnected from the machine, so that it was not attached at the time of the explosion. As has been said, no harm was done in this instance because the machine was far removed from the patient. On a small scale this illustrates exactly the situation that is being met generally throughout the country when the gas machine is flushed with oxygen instead of with nitrous oxide.—John S. Lundy, in *J. A. M. A.,* July 9, 1932.

Granulopenia and Agranulocytic Angina: A resume of the literature on granulopenia and agranulocytic angina is made by Henry Harkins (*J. A. M. A.,* Oct. 1, 1932), with report of seventeen cases of granulopenia observed in the University of Chicago hospitals, eight of which were primary and four recurrent. In primary granulopenia, the oral lesions and sepsis were found to be secondary to the granulopenia. It was concluded that primary granulopenia may be due to some endogenic factor such as allergy, endocrine disturbance or congenital deficiency of the bone marrow, or the causative factor may be an exogenic agent, acting either on a normal person or on a person with a special susceptibility, and that unknown organisms, B. influenzae and chemical poisons are to be considered. The causative agent acts chiefly on the bone marrow. As regards treatment, it was found that oral antisepsis merely delays the entrance of malignant organisms into the system. Conversely, attempts to restore the white cell count to normal will not save the patient's life if sepsis is too advanced. Blood transfusion and roentgen rays are of no proved value. Chemical agents intended to stimulate the bone marrow are in general ineffective. Some evidence has collected to indicate that nucleotide is of value in primary granulopenia. Nucleotide did not affect the course of the granulopenia in acute benzine poisoning in rabbits.

MISCELLANY

COMMITTEE ON LEGISLATION AND CORRELATION

By HOMER C. BROWN,* D.D.S., F.A.C.D.,
Columbus, Ohio

The question of safeguarding the interests of the dental profession and the relation of dental service to all general health problems has never received the consideration from organized dentistry that its importance deserves, but in spite of this neglect or indifference, substantial progress has been recorded. Educational propaganda, followed by such changes in our legislative status, is largely responsible for this, but it should be fully recognized that legislators seldom enact laws until the question involved has received the approval of the public forum. Regardless of this assumed indifference, much favorable legislation and many regulations have been secured during the past two decades, which has been largely due to the following:

1. The fact that dental service has become more and more recognized as an important factor in health promotion.

2. The persistence of a limited number of persons believing in and supporting such programs.

3. The fact that, during most of this time, the general economic conditions have been favorable for advanced constructive legislation.

4. In at least the most important problem, equal status legislation for the Army Dental Corps, "luck" broke in our favor during the closing hours of Congress in October, 1917.

During this two-decade period, our percentage of successes has been rather phenomenal, but it must be recognized that it may be as difficult to maintain our present position as it was to secure it if it is not more so. To combat destructive legislation and regulations will, no doubt, require greater attention and diplomacy than is necessary in promoting any well prepared and approved program. This is largely due to the fact that we cannot always be informed as to the plans of our opponents and, under present economic conditions, radical proposals are likely to emanate from sources least suspected.

Therefore, in an effort to develop a coordinated program, the Committee on Legislation and Correlation has made a contact with the president, the secretary and the chairman of the Legislative Committee of each state dental society, as well as the secretary of each state dental board, with a view to developing a closer cooperative arrangement which should be beneficial to the American Dental Association, as well as to the state organizations. In this connection, we respectfully request that a careful study be made of the report of the Committee on the Costs of Medical Care, released Nov. 29, 1932.

Further, our committee solicits the support of all members of organized dentistry and will give careful consideration to such suggestions as any member desires to submit.

*Chairman.

A DECISION OF THE CALIFORNIA SUPREME COURT

A recent decision of the Supreme Court of California, supporting the action of the state dental board in revoking the license of one "Painless" Parker, is probably one of the most important and far-reaching decisions affecting the practice of dentistry that have ever been rendered. Therefore, for the information of the members of the American Dental Association, a syllabus of the abovementioned decision, forwarded by E. Ray Brownson, is incorporated herein, as follows:

CALIFORNIA SUPREME COURT DECISION

PAINLESS PARKER, Plaintiff and Appellant, v. THE BOARD OF DENTAL EXAMINERS OF THE STATE OF CALIFORNIA and O. E. JACKSON, C. E. PRYOR, HARVEY STALLARD, C. A. HERRICK, BERT BOYD, J. M. BLODGETT and E. O. LAWING, as members and comprising said Board of Dental Examiners, Defendants and Respondents.

(1) DENTISTS-LEGISLATURE-POLICE POWER.—The legislature has power to regulate the practice of dentistry, not only on the ground that it concerns public health, but also on the ground that it is the state's duty to enact laws which will afford protection to public morals.

(2) ID.—CORPORATIONS-LICENSES.—The law does not assume to divide the practice of dentistry into a "business side" and the actual performance of the dental work,

the subject being treated as a whole, and under the Dental Act a corporation or unlicensed person may not legally manage, conduct or control the "business side" of the practice of dentistry.

(3) ID. — UNPROFESSIONAL CONDUCT-SUSPENSION OF LICENSE-EVIDENCE-FINDINGS.—In this proceeding to review an order of the Board of Dental Examiners suspending petitioner's license to practice dentistry for a period of five years, the evidence was sufficient to support the findings of the board that petitioner aided and abetted a corporation and a natural person, who were not licensed to practice dentistry, to unlawfully engage in the practice of dentistry, and that petitioner had used false, assumed and fictitious names in conducting and engaging in the practice of dentistry in this state.

(4) ID.—JURISDICTION.—In such proceeding, the acts of petitioner were within the purview of the statute defining unprofessional conduct, and the Board of Dental Examiners therefore had jurisdiction to suspend petitioner's license.

(5) ID.—LACHES.—Delayed action on the part of those who are charged with the execution of laws will not be permitted to annul the law, and in such proceedings, where it appeared that for a period of some fourteen years the Board of Dental Examiners and petitioner had had frequent controversy as to the legality and professional propriety of petitioner's methods employed in the practice of dentistry, and that at no time was the subject set at rest, there was no merit in the contention that the long period of time over which petitioner had operated and the interpretation that the board and its legal advisors had placed upon the statute was entitled to weight in determining the question as to whether or not petitioner was guilty of unprofessional conduct.

(6) ID.—WITNESSES-IMMUNITY.—In such proceeding, petitioner could not complain that several witnesses against him testified under a promise of immunity from prosecution if they would testify under the provisions of section 1324 of the Penal Code, which section had been repealed some fourteen years prior to the day of the hearing, the competency of evidence not depending in any way upon the means by which it is brought into court, where it is offered in evidence.

(7) ID. — UNPROFESSIONAL CONDUCT-PUNISHMENT.—In such proceeding, even if it were to be admitted that the suspension of petitioner from the practice of dentistry for a period of five years was excessive, the matter was one for the Board of Dental Examiners, and the order could not be modified by the court.

Appeal by plaintiff from a judgment of the Superior Court, City and County of San Francisco, Walter Perry Johnson, Judge, in an action to set aside order of the Board of Dental Examiners suspending petitioner's license to practice. *Affirmed.* Langdon, J., *dissents.*

The majority decision was signed by five members of the court and requires ten printed pages. There is a minority decision, signed by one member, requiring more than seven pages. The foregoing gives a brief synopsis of the essential features.

COLORADO SUPREME COURT DECISIONS

Since the foregoing was submitted to the Editor, two interesting articles have appeared in the December 3 issue of the *Journal of the American Medical Association,* under the heading of "Medicolegal," as follows: 1. Dental Service in Aid of Corporate Practice: Suspension of License. 2. Dental Service in Aid of Corporate Practice: Revocation of License.

These are very illuminating decisions as they add another important link in the chain, relating to the authority granted the state dental boards in the enforcement of our dental laws, in order to better conserve the health interests of the public. Throughout all these decisions, much emphasis is placed on the public health phase of this problem.

Attention is directed to these articles. For the information of those interested in the details, it is suggested that reference be made to a copy of this issue, pages 1976-1978. An effort will be made to secure reprints of these articles; also, reprints of the California decision, in the event that the California bulletin published this in full.

The state dental boards and the profession of California and Colorado should be congratulated by the public and by organized dentistry for the vigorous campaign that they waged in the foregoing litigation.

609 Hartman Building.

RESOLUTIONS ADOPTED BY THE OHIO STATE DENTAL SOCIETY

WHEREAS, dental service is recognized as an integral part of health service, and,

WHEREAS, the Majority Final Report of the Committee on the study of the Cost of Medical Care was released through the public press, Nov. 29, 1932, and,

WHEREAS, some of the principles advocated in this report are not consistent with the development and maintenance of the most efficient type of dental service for the public; namely (1) the danger of the destruction of the personal relationship between the dentist and the patient; (2) the danger of the degradation of dental science, education and service; (3) the danger of bureaucracy and political domination with the ultimate result that the cost of dental care would be increased to the public, and,

WHEREAS, the primary objective of scientific dentistry is the prevention of dental disease, which objective cannot be attained by or through the socialization of health service, as recommended in this report, and,

WHEREAS, the results obtained in European countries, where socialized dentistry has been in operation, clearly indicate that there has been a definite lowering of the quality of dental service, and,

WHEREAS, the program proposed in respect to compulsory insurance and state control of dentistry cannot be carried out without increasing the tax burden of all citizens; therefore, be it

Resolved, that the Ohio State Dental Society in its sixty-seventh annual session in Cleveland, Ohio, Dec. 6, 1932, does not concur in, or approve of, the report which contemplates the socialization of health service, as relates to the practice of dentistry, and be it further

Resolved, that the Ohio State Dental Society is deeply concerned in the development of a constructive program directed toward the conservation of the dental health of all the people, and which emphasizes the prevention of dental diseases. This Society believes that this can only be accomplished by retaining a close personal relationship between the dentist and the patient, and by attracting to the profession men of the highest type. These aims cannot be achieved by complying with some of the fundamental conditions outlined in the plan of the Majority Final Report of the Committee on the Costs of Medical Care.

The foregoing resolutions were unanimously adopted by the House of Delegates of the Ohio State Dental Society and referred to the Committee on Legislation and Dental Education of that society for further study.

Attest: Edward C. Mills, *Secretary,*
255 East Broad Street,
Columbus, Ohio.

THE ESSENTIAL FEATURES OF THE ADOPTED PLAN FOR AN INCREASE IN MEMBERSHIP OF THE AMERICAN DENTAL ASSOCIATION

To the Officers and Members of the Constituent State Societies and District Component Societies of the American Dental Association:

At the annual meeting of the American Dental Association in Buffalo, Sept. 12-16, 1932, a definite plan was adopted by the House of Delegates to "increase and maintain the numerical membership of the American Dental Association and Its Constituent State Societies."

This plan involves the inauguration and establishment of a permanent annual membership contest between the constituent state dental societies; and provides a method of coordinating all the dental colleges, the boards of dental examiners and constituent dental societies of all the states with the Central Office of the American Dental Association to make the plan effective. The respective features of the plan are as follows:

1. Since members of the American Dental Association whose current annual dues are not paid by March 1 become delinquent, the membership contest year shall extend from March 1 of any one year to March 1 of the next succeeding year.

2. To equalize conditions as much as possible between large and small state societies, the factors involved in each annual contest are to be graded on a percentage basis, the value assigned to each factor to be decided by the Conference of State Society Officers.

3. The two factors involved in the contest are the percentage of dentists secured as members; and the percentage of members whose dues are paid within the time limit each year as fixed by the Conference of State Society Officers.

4. The Conference of State Society Officers is to agree on the penalty in percentage

deducted from any constituent state society guilty of accepting for membership any unethical dentist, any dispute in this connection to be decided by the Judicial Council of the American Dental Association.

5. The Conference of State Society Officers is to adopt regulations in conformity with the general plan, to govern the extension of the competitive membership contests to the district component societies of each state society.

6. The American Dental Association has established a standing committee on organization and membership consisting of five members, one of whom is the General Secretary and he is to be the secretary of the committee. This committee is to have charge of the annual membership contests between the state societies and submit proper recommendations to the respective state societies.

The activities of this committee will be directed through the Central Office of the American Dental Association.

7. For convenience of presentation, the plan is divided under two headings: A. As applied to dentists already established in practice. B. As applied to recent dental graduates who have been licensed to practice.

8. A. The secretary of the board of dental examiners of each state should provide duplicate lists, annually revised, of the names and addresses of all the active licensed dentists in the state represented by the dental board; one of these lists to be forwarded each year to the Committee on Organization and Membership of the American Dental Association, and the other list each year to be sent to the secretary of the state dental society of that state. This annually corrected list of licensed dentists would be used to compute the membership rating of the constituent dental society of the state represented by the list. On receipt of the list of licensed dentists each year, the secretary of each state dental society would arrange as many subordinate lists as there were district component societies in his state dental society; each subordinate list representing all the licensed dentists within the jurisdiction of the district component society to which it was sent.

9. A. Only ethical dentists could be accepted as members and each district component society would be expected to arrange for eligible dentists to be personally solicited for membership. Whenever possible, eligible nonmembers should be given the privileges of one annual meeting of the state society before being solicited to join as members. Membership blanks and information concerning the American Dental Association would be supplied from the Central Office of the American Dental Association. Necessary additional regulations would be as agreed on by the American Dental Association Committee on Organization and Membership and the Conference of State Society Officers.

10. B. To secure as members initially licensed dental graduates would require the cooperation of the respective state dental societies, the dental colleges and the boards of dental examiners of the respective states with the Committee on Organization and Membership through the Central Office of the American Dental Association. The method adopted is as follows:

(*a*) After March 1 of each year, there would be sent from the Central Office of the American Dental Association to each dental college in sufficient number to supply each member of the Senior class leaflet form copies of the Code of Ethics of the American Dental Association, registration cards lettered with the name of the dental college and copies of a special form of student declaration blank. The authorities of each college would be furnished a brief statement of the plan of organization and activities of the American Dental Association. Each college would assign one of its most effective speakers to analyze for the members of the Senior class the different provisions of the Code of Ethics and the purposes and activities of the American Dental Association and its constituent state societies, and to supervise and secure the proper information from each Senior on the registration cards and declaration blanks. On the registration card, each student would enter the name and permanent address of himself and parent or guardian. Without coercion, each student would have the option of filling out a declaration blank on which he would declare his understanding and acceptance of the Code of Ethics of the American Dental Association, and his desire to become a member as soon as he had secured a state license to practice dentistry. The registration cards and declaration blanks are to be verified by the college authorities and forwarded to the Central Office of the American Dental Association. After the first

year of operation of the plan, each dental college would be furnished a list showing how many members of its preceding year's Senior class had joined the American Dental Association through a constituent state society.

(*b*) On receipt of the registration cards by the American Dental Association Central Office, the cards would be checked and properly filed for future reference.

(*c*) On receipt by the Central Office of the declaration blanks, the essential items would be recorded on special cards for future reference, and the declaration blank of each dental graduate would be mailed to the secretary of the constituent state dental society of the state where the graduate had been licensed to practice dentistry.

(*d*) As soon as possible after licenses to practice have been issued to successful applicants, the secretary of each state board of dental examiners would fill out a report in triplicate listing the name, permanent address and college of graduation of each newly licensed dentist. One of these reports would be mailed to the secretary of the Committee on Organization and Membership at the Central Office of the American Dental Association. One copy of this list would be sent to the secretary of the state dental society directly involved; and the third copy would be retained by the secretary of the state dental board for his files.

(*e*) Immediately after the receipt of these reports from the different state boards of dental examiners, the General Secretary of the American Dental Association would send a letter of congratulation and encouragement to each initially licensed dentist, and inform him that for several months (the exact number to be authorized by the American Dental Association Board of Trustees), he would receive the JOURNAL with the compliments of the American Dental Association. Initially licensed dentists residing in the vicinity of that year's meeting place of the American Dental Association would receive a visitor's privilege of attending the meeting.

(*f*) Upon receipt of the list of initially licensed dentists for that state, the secretary of each state dental society would send a letter of congratulation and encouragement to each new dentist, and in those state societies that publish bulletins, the initially licensed dentists of such states should be placed on the free mailing list of such bulletins for a length of time approved by that state society's officers. Each state society bulletin should publish the complete list of initially licensed dentists of that state, and as promptly as possible the location selected by any new dentist should be published as a news item. Each initially licensed dentist should also receive a card entitling him to a visitor's privilege at the next meeting of the state dental society, if he had not affiliated as a member prior to that date.

(*g*) Each state dental society would be requested to enact, where necessary, amendments to its constitution and by-laws to provide that initially licensed dentists be placed on the free mailing list of the state society bulletin; and also amendments to provide that to initially licensed dentists, the membership fee (if any) be cancelled, and the annual dues of the state society be remitted for the remainder of the year of issue of the license and the first year succeeding the year when the new dentist had been licensed to practice. Each state dental society would be urged to prevail on its district component societies to remit their membership fees and annual dues to initially licensed dentists for a like period of time. This arrangement would insure to the initially licensed dentist membership in the district component, state and national societies by the payment of but $4 as dues in the American Dental Association for the year succeeding the year he was licensed to practice dentistry, and it would not be until the beginning of the second calendar year after he had been licensed that he would be called on to pay dues in all the member societies.

(*h*) The Conference of State Society Officers would decide how many state societies would have to ratify these regulations before the membership plan could be inaugurated.

(*i*) Each constituent state society would be urged to establish as a part of its annual meeting a conference of the officers of its district component societies to facilitate unity of action in the annual membership campaigns and to strengthen the local organizations.

(*j*) As soon as an initially licensed dentist had established his dental office, the secretary of the component district society having jurisdiction should write the newcomer a letter of welcome and invitation to be a guest at the next meeting of the district component society.

(*k*) Each district component society should arrange for the membership campaign to be held the latter part of the calendar year; if possible, after a program meeting of the society to which all of the eligible membership prospects had been invited as guests. Where this is not feasible, all of the eligible dentists should be approved for membership prior to being solicited to join.

(*l*) In all cases, the membership campaign should be conducted by personal solicitation of the eligible prospects. Each district component society should establish a membership committee with a member from each county represented by the society in which dentists were established. These county representatives, in addition to securing new members, would help in preventing members from becoming delinquent as to dues.

11. To stimulate and maintain interest in the annual membership contest, the American Dental Association will award each year a cash prize of one thousand dollars to the successful constituent state society, with the reservation that a state society cannot qualify for the cash prize oftener than once every five years or for any longer period of time that would be agreed on by the Conference of State Society Officers and approved by the Board of Trustees of the American Dental Association. The further limitation was established that a state society having won the membership cash prize could not again compete for this prize unless it was able to start in such a subsequent contest with as many bona fide members as it had at the end of the contest the year it last won the prize.

12. A list of all the constituent state societies arranged in the order of their membership rating will be published in each issue of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.

13. It was provided that any necessary additional regulations in the membership contests could be adopted on the recommendation of the American Dental Association Committee on Organization and Membership, and by the Conference of State Society Officers, subject to the approval of the Board of Trustees of the American Dental Association.

14. In addition to securing support of the plan by the state constituent societies and their respective district component societies, the American Dental Association Committee on Organization and Membership was authorized to secure the cooperation of the American Association of Dental Schools and the National Association of Dental Examiners to make the plan effective.

15. Necessary amendments to the Constitutional and Administrative By-Laws of the American Dental Association were adopted to provide for a standing committee on organization and membership and defining its duties, and also to provide authority for essential features of the membership plan.

John Scholten, Cedar Rapids, Iowa,
C. B. Warner, Biloxi, Miss.
Fred Miller, Altoona, Pa.
Harry B. Pinney, Chicago, Ill.,
Secretary.
Albert R. Ross, Lafayette, Ind.,
Chairman.

REPORT OF COMMITTEE ON AMERICAN DENTAL HEALTH CENTER IN KOREA TO THE BOARD OF TRUSTEES OF THE AMERICAN DENTAL ASSOCIATION (SEPT. 10, 1932)*

The Committee on the American Dental Health Center in Korea is pleased to report that the clinic building has been erected and is completed and in operation.

Because of the failure of contributions to this activity to reach the original amount asked for, it was necessary to modify the original plans and do the best possible work with such funds as were available or could be borrowed.

An American traveler who has just returned from a trip around the world made this statement in connection with the dental health center: "This is the finest piece of mission equipment that I have seen around the world."

The completion of the building and the equipping of it in a creditable way has caused a deficit of 10,000 yen over the amount paid in and Dr. Boots has been compelled to raise that amount of money on a six months bank loan in Korea, on which it is necessary for him to pay 10 per cent interest.

There is still about $2,000 of unpaid subscriptions standing on the books, and if those who subscribed would pay up their subscriptions, it would be of particular help to the health center at this time.

At the time the building was erected, the

*Received for publication, Dec. 7, 1932.

yen was quoted on world exchange at 50 cents. It has since dropped to under 30 cents because of Japan's going off the gold standard. This would mean that subscriptions paid now in American money would be worth about 3 yen to the dollar instead of 2 as was the case heretofore.

Your committee urges that an effort be continued to solicit payment of all unpaid subscriptions.

(Signed) J. V. Conzett,
H. E. Friesell

NEWS

New Building for Indiana University School of Dentistry: By action of the Board of Trustees of Indiana University, construction of a new building to house the dental school has been begun and the school will occupy its new quarters by August, 1933. The building will be 220 feet in length, 65 feet in width and three stories high and will be constructed of Indiana limestone. The main clinic, which will be on the third floor, will be equipped with eighty chairs and units, besides the separate units for prosthetics, crown and bridge work and surgery. Provision is also made for abundant space for dental research. The new building is located in the Indiana University Health Center on West Michigan Street in the City of Indianapolis, The health center consists of the Dental School, Medical School, Long General Hospital, Coleman Maternity Hospital, James Whitcomb Riley Hospital for Crippled Children, School for Nurses, Rotary Convalescent Home for Children and all of the social services. The new building has been designed after long and careful study of the modern dental school buildings of the United States and Canada and is believed to represent the best in arrangement and facilities for dental education. Because of the close cooperation which will be possible with the great Riley Children's Hospital, a specially arranged and designed children's clinic will be made a feature.

A Broken Needle Not Negligence: Should a dentist break a needle in attempting an injection with novocaine into a patient's gums, he is not to be convicted of negligence in his daily work. The Supreme Court of North Carolina had this to say in such a case quite recently. The dentist did not make the needle; nor was it shown that a defect existed; that such a defect, if it did exist, could be detected; or that there was negligence in the handling of the needle. The evidence did prove, however, that the defendant did everything in his power to remove the broken piece. The Court made the comment that should it rule against the defendant, it would be in the nature of imposing the liability of an insurer against a physician or a dentist.—*Dominion D. J.*, November, 1932.

Deaths

Birkett, Charles H., East Liverpool, Ohio; Chicago College of Dental Surgery, 1878, died, September 30; aged 76. In 1928, Dr. Birkett celebrated his fiftieth year in the practice of dentistry. The widow and two sons and two daughters survive. A daughter, Lillian E., and son, J. H., are dentists.

Bronson, G. A., St. Louis, Mo.; Washington University School of Dentistry, 1897; died, October 14.

Callihan, P. E., McRae, Ga.; Atlanta Dental College, 1898; died suddenly, October 22; aged 62. He is survived by the widow, one son, George E. Callihan, a dentist, and one daughter.

Gaskill, J. Howard, Philadelphia, Pa.; Pennsylvania College of Dental Surgery, 1887; died recently. Dr. Gaskill served as a major in the United States Army in the World War, being attached to Base Hospital Unit 38, composed of the Jefferson Hospital Group, and later of the American Expeditionary Force Beaune University Hospital.

Holaday, Harry E., Kansas City, Mo.; Kansas City Dental College, 1908; died October 24.

Koenig, E. L., St. Louis, Mo.; Marion-Sims Dental College, 1901; died, October 24.

Mobley, Berry Hill, Atlanta, Ga.; Atlanta Dental College, 1916; died, September 18; aged 53. The widow and two daughters survive.

Paulsen, Augustus F., New York City; New York Dental School, 1897; died, November 22; aged 55.

Werninghaus, William E., Melrose Park, Ill.; University of Illinois, College of Dentistry, 1915; was killed in a motor accident, November 27; aged 42.

ANNOUNCEMENTS*

CALENDAR OF MEETINGS

American Dental Association in conjunction with the Chicago Centennial Dental Congress, Chicago, Ill., August 7-12.

American Dental Society of Europe, Le Touquet, France, April.

American Society of Orthodontists, Oklahoma City, Okla., April 19-21.

Buffalo University School of Dentistry Alumni Association, Buffalo, N. Y., March 1-3.

Central Pennsylvania Seventh District Dental Society, Johnstown, February 27-28.

Great Lakes Association of Orthodontists, Cleveland, Ohio, February 27-28.

Society for Advancement of General Anesthesia in Dentistry, New York City, third Monday in February, April, October and December.

Thomas P. Hinman Midwinter Clinic, Atlanta, Ga., March 13-14.

Washington University Dental Alumni Association, St. Louis, Mo., February 20-22.

STATE SOCIETIES

District of Columbia, at George Washington University, Washington, D. C., second and fourth Tuesdays in each month from October to June, inclusive.

January

Delaware, at Wilmington (11).
Rhode Island, at Providence (25-26).

February

Minnesota, at Minneapolis (7-9).

April

Alabama, at Birmingham (24-26).
California (State), at Del Monte (20-22).
Connecticut, at Bridgeport (19-21).
Kansas, at Topeka (24-26).
Kentucky, at Louisville (3-5).
Michigan, at Grand Rapids (10-12).
Montana, at Billings (20-22).
New Jersey, at Atlantic City (26-28).
Oklahoma, at Oklahoma City (17-20).
Tennessee, at Knoxville (27-29).
Virginia, at Richmond (24-26)

May

Illinois, at Peoria (9-11).
Indiana, at Indianapolis (15-17).
Iowa, at Des Moines (2-4).
Maryland, at Baltimore (1-4).
Massachusetts, at Boston (1-4).
Missouri, at St. Louis (15-17).
Nebraska, at Omaha (15-18).
New York, at Syracuse (11-13).
Pennsylvania, at Philadelphia (2-4).
South Carolina, at Columbia (22-23).
Texas, at San Antonio (9-11).
Vermont, at Burlington (17-19).
West Virginia, at Charleston (15-17).

June

Arkansas, at Little Rock (5-7).
California (Southern), at Los Angeles (5-7).
Colorado, at Colorado Springs (19-21).
Georgia, at Savannah (12-14).
Maine, at Rangeley Lake (22-24).
Nevada, at Reno (3).
North Carolina, at Chapel Hill (6-8).
Oregon, at Portland (21-24).
Utah, at Ogden (1-3).
Washington, at Yakima (June 30-July 2).

STATE BOARD OF DENTAL EXAMINERS

Delaware, at Wilmington, January 18-19. W. S. P. Combs, Secretary, Middletown.

Kentucky, at Louisville, June 7-10. Robert L. Sprau, Secretary, 970 Baxter Bldg., Louisville.

North Dakota, at Fargo, January 10-13. R. E. Percy, Secretary, Mandan.

South Dakota, at Sioux Falls, January 5-7. Jolin J. Berry, Secretary, Deadwood.

NEW JERSEY STATE DENTAL SOCIETY

The sixty-third annual meeting of the New Jersey State Dental Society will be held in the Ambassador Hotel, Atlantic City, April 26-28.

F. K. HEAZELTON, *Secretary*
223 E. Hanover St.
Trenton

GEORGIA DENTAL ASSOCIATION

The Georgia Dental Association will hold its sixty-fifth annual meeting at Savannah, June 12-14, at the Hotel DeSoto.

R. H. MURPHY, *Secretary*
Georgia Casualty Bldg.
Macon

*Announcements must be received by the fifth day of the month in order to be published in the forthcoming issue of THE JOURNAL.

THOMAS P. HINMAN MIDWINTER CLINIC

The Thomas P. Hinman Midwinter Clinic will hold its annual meeting, March 13-14, at the Biltmore Hotel, Atlanta.

JOSEPH D. OSBORNE, *Secretary*
604 Doctors' Bldg.
Atlanta

COLORADO STATE DENTAL ASSOCIATION

The Colorado State Dental Association will hold its forty-seventh annual convention at the Antlers Hotel, Colorado Springs, June 19-21.

BERTRAM H. DOWNS, *Secretary*
609 Exchange Nat. Bank Bldg.
Colorado Springs

KENTUCKY BOARD OF DENTAL EXAMINERS

The Kentucky State Board of Dental Examiners will meet in Louisville, June 7-10, for the examination of candidates to practice dentistry in the State of Kentucky. Address communications to

ROBERT L. SPRAU, *Secretary*
970 Baxter Bldg.
Louisville

SOUTHWESTERN SOCIETY OF ORTHODONTISTS

The governing board of the Southwestern Society of Orthodontists has decided to postpone the 1933 meeting at Abilene, Texas, until 1934, in order that the society may concentrate its efforts toward a successful meeting of the A. S. O. at Oklahoma City, Okla.

CURTIS WILLIAMS, *Secretary*
716 Medical Arts Bldg.
Shreveport, La.

NORTH CAROLINA DENTAL SOCIETY

The fifty-ninth annual meeting of the North Carolina Dental Society will be held at the University of North Carolina, Chapel Hill, June 6-8.

D. L. PRIDGEN, *Sec'y-Treas.*
Fayetteville

FIRST DISTRICT DENTAL SOCIETY PATHODONTIA SECTION

The next meeting of the Pathodontia Section of the First District Dental Society of New York will be held, January 16, 8 p. m., at the Academy of Medicine, New York City. Lewellys F. Barker, M.D., of Johns Hopkins University, will give the first of the M. L. Rhein memorial lectures. Physicians and dentists are invited.

NATHANIEL FREEMAN, *Secretary*
5 East 57th St.
New York City

DENTAL SOCIETY OF THE STATE OF NEW YORK

The Dental Society of the State of New York will hold its sixty-fifth annual meeting in Syracuse, May 11-13, at the Hotel Syracuse. Harvey J. Burkhart, 800 E. Main St., Rochester, is chairman of the program committee; Emory Thompson, 333 Linwood Ave., Buffalo, chairman of the clinic committee and Thomas R. Cullen, Oswego, chairman of the exhibits committee. For information with reference to the literary program, clinics, etc., address

A. P. BURKHART, *Secretary*
57 East Genesee St.
Auburn

CENTRAL PENNSYLVANIA SEVENTH DISTRICT DENTAL SOCIETY

The thirty-first annual meeting of the Central Pennsylvania Seventh District Dental Society will be held in the Fort Stanwix Hotel, Johnstown, February 27-28. For further information, address J. W. Lynam, 126 Market St., Johnstown.

J. L. PORIAS, *Rec. Sec'y.*
Nanty-Glo

KENTUCKY STATE DENTAL ASSOCIATION

The sixty-fourth annual meeting of the Kentucky State Dental Association will be held in Louisville, April 3-5.

J. H. FULLENWIDER, *Sec'y-Treas.*
1101 Heyburn Bldg.
Louisville

GREAT LAKES ASSOCIATION OF ORTHODONTISTS

The annual meeting of the Great Lakes Association of Orthodontists will be held in Cleveland, Ohio, February 27-28. All ethical dentists are invited.

RALPH P. HOWARTH, *Sec'y-Treas.*
1140 Hanna Bldg.
Cleveland, Ohio

WESTCHESTER DENTAL SOCIETY

The Westchester Dental Society will hold its annual medical and dental meeting at the Hotel Towers, Valentine Lane, Yonkers, N. Y., January 17; with V. H. Kazanjian, Harvard University, and H. L. Dunning,

Columbia University, essayists. This is an open meeting.

SIMON MILLER, *Editor*
20 South Broadway
Yonkers, N. Y.

MONTEFIORE HOSPITAL JOINT CONFERENCES OF MEDICAL AND DENTAL DEPARTMENTS

The joint conferences of the departments of medicine and dentistry of Montefiore Hospital, New York City, will be resumed, January 25. William J. Gies will speak on "The Dentist as Teacher and Investigator." Meeting at 8:15 p. m. Dentists and physicians are invited.

AMERICAN DENTAL SOCIETY OF EUROPE

The next meeting of the American Dental Society of Europe will be held at Le Touquet, at Easter time (April).

DAWSON BUCKLEY, *Secretary*
25 Blvd. Victor Hugo
Nice, France

UNIVERSITY OF BUFFALO SCHOOL OF DENTISTRY ALUMNI ASSOCIATION

The thirty-third annual meeting of the University of Buffalo, School of Dentistry, Alumni Association will be held in Buffalo at the Hotel Statler, March 1-3. All ethical dentists are invited.

LEON J. GAUCHAT, *Chairman of Publicity*

WASHINGTON UNIVERSITY DENTAL ALUMNI ASSOCIATION

The annual meeting of the Washington University Dental Alumni Association will be held at the Washington University Dental School, 4559 Scott Ave., St. Louis Mo., February 20-22, with lectures by faculty members and special courses by George B. Winter and Max Kornfeld. There is no charge for these courses.

LEO M. SHANLEY, *Secretary*
4482 Washington Ave.
St. Louis, Mo.

"GOOD FOOD FOR LITTLE MONEY"

The American Child Health Association, in an effort to help in the present emergency, has issued a leaflet entitled "Good Food for Little Money, to Protect the Health of Children" by Lucy H. Gillett. The pamphlet reads in part as follows:

"The less money a family or a community has to spend, the more necessary it is to spend that money to the best advantage. Study the following and help to save the children from future suffering by vigorously emphasizing the need of foods that will protect health:

"Milk: 1 quart per child per day if possible; at least a pint. A tall can of evaporated milk with an equal amount of water added is as good for children as one quart of pasteurized milk. Use it in soups, cocoa, desserts, and to drink.

"Vegetables and fruit: Potatoes and one or more of these daily: carrots, turnips, beets, onions, cabbage, spinach, lettuce, escarole, peas, beans, or other vegetables; oranges, apples, bananas, or other fruit. A raw vegetable, such as chopped cabbage or grated carrot, at least 3 or 4 times a week. Oranges or tomatoes every day if possible. Canned vegetables may be used in place of fresh vegetables when cheaper.

"Bread and cereals: Bread and cereals, one or both at every meal. Dark or whole grain bread and cereal are best for growth; use at least once daily.

"Eggs, meat, fish, cheese, dried beans, peas and lentils: One or more of these foods daily if possible. An egg at least every other day but never more than one egg daily. Brown eggs and white eggs are equally good. Use meat never more than once daily. Cottage and cream cheese may be given to young children.

"Fats and sweets: Enough fat to make food palatable, but avoid large amounts. Fried foods should not be given to children. Use sugar only in cooked foods." Then follows a table entitled "A Week's Food Orders for Families of Various Sizes."

The leaflets are priced as follows: 1-3, 3 cents each; 4-9, 1 cent each; 10-24, 0.8 cents each; 25-99, 0.7 cents each; 100 copies, 50 cents; 500, $2.25; 1,000 to 5,000 copies, $3.50 per thousand, f. o. b., New York. The address of the American Child Health Association is 450 Seventh Ave., New York City.

VACANCY FOR DENTAL INTERN

Beginning July 1, there will be a vacancy for a dental intern at the Unity Hospital, 1545 St. Johns Place, Brooklyn, N. Y. Applications should be sent to the chief of the dental division, William H. Hyde, 857 Eastern Parkway, Brooklyn, or to the hospital direct. The internship is for one year.

WILLIAM H. HYDE

DIRECTORY OF STATE SOCIETY OFFICERS AND DATES OF MEETINGS, 1933

ALABAMA

R. J. McGavock, President.....Woodward Bldg., Birmingham
Frank F. Perry, Secretary-Treasurer.....Montgomery
Date of next meeting: April 24-26, 1933.
Place of next meeting: Tutwiler Hotel, Birmingham.

ARIZONA

William J. Johnson.....Luhrs Tower, Phoenix
Paul H. Bennett, Secretary-Treasurer.....Consolidated Bank Bldg., Tucson
Date of next meeting: April, 1933.
Place of next meeting: Phoenix.

ARKANSAS

H. L. Leathers, President.....Fayetteville
I. M. Sternberg, Secretary-Treasurer.....Merchants Nat'l Bk. Bldg., Fort Smith
Date of next meeting: June 5-7, 1933.
Place of next meeting: LaFayette Hotel, Little Rock.

CALIFORNIA (STATE)

Roy A. Green, President.....Medico Dental Bldg., Sacramento
Frederick T. West, Secretary.....2180 Washington St., San Francisco
Howard Dunn, Treasurer.....1904 Franklin St., Oakland
Date of next meeting: April 20-22, 1933.
Place of next meeting: Hotel Del Monte, Del Monte.

CALIFORNIA (SOUTHERN)

Frank G. Staley, President.....1258 Roosevelt Bldg., Los Angeles
Stanley Rice, Secretary.....1048 Roosevelt Bldg., Los Angeles
Fred B. Olds, Treasurer.....1152 Roosevelt Bldg., Los Angeles
Date of next meeting: June 5-7, 1933.
Place of next meeting: Biltmore Hotel, Los Angeles.

COLORADO

F. W. Beesley, President.....624 Republic Bldg., Denver
Bertram H. Downs, Secretary.....609 Ex. Nat'l Bank Bldg., Colorado Springs
Edward C. Carter, Treasurer.....962 Metropolitan Bldg., Denver
Date of next meeting: June 19-21, 1933.
Place of next meeting: Antlers Hotel, Colorado Springs.

CONNECTICUT

J. Francis Keeley, President.....1115 Main St., Bridgeport
C. W. Vivian, Secretary-Treasurer.....Elbridge Road, New Britain
Date of next meeting: April 19-21, 1933.
Place of next meeting: Stratford Hotel, Bridgeport.

DELAWARE

R. E. Price, President.....Medical Arts Bldg., Wilmington
W. Ralph Staats, Secretary.....Medical Arts Bldg., Wilmington
P. A. Traynor, Treasurer.....807 Washington St., Wilmington
Date of next meeting: Jan. 11, 1933.
Place of next meeting: Wilmington Country Club, Wilmington.

DISTRICT OF COLUMBIA

Charles D. Cole, President.....1835 Eye St., N. W., Washington
W. M. Simkins, Secretary-Treasurer.....720 Woodward Building, Washington
Meetings twice a month, second and fourth Tuesdays
from October to June at George Washington University.

FLORIDA

A. W. Sears, President.....616 Professional Bldg., Jacksonville
R. D. Cummins, Secretary-Treasurer.....413 Equitable Bldg., St. Petersburg
Date of next meeting: November, 1933
Place of next meeting: Marion Hotel, Ocala.

GEORGIA

Harry B. Johnston, President.....Candler Building, Atlanta
R. H. Murphy, Secretary.....Georgia Casualty Building, Macon
Bryant K. Vann, Treasurer.....Candler Building, Atlanta
Date of next meeting: June 12-14, 1933.
Place of next meeting: Hotel Desoto, Savannah.

HAWAII

H. L. Gibson, President.....432 Damon Bldg., Honolulu
J. A. Pekelo, Secretary-Treasurer.....471 South Beretania St., Honolulu
Date of next meeting:
Place of next meeting:

IDAHO

H. J. Dyer, President.....Shelly
Vaughan D. Lyons, Secretary.....Pocatello
E. B. Carpenter, Treasurer.....Boise
Date of next meeting: June, 1933.
Place of next meeting: Pocatello.

ILLINOIS

A. B. Patterson, President.....406 Morris Building, Joliet
B. H. Sherrard, Secretary.....300 Rock Island Bank Building, Rock Island
D. H. Daniels, Treasurer.....909 Lehmann Building, Peoria
Date of next meeting: May 9-11, 1933.
Place of next meeting: Peoria.

INDIANA

A. L. Harter, President.....602 Citizens Bank Building, Kokomo
C. L. Byers, Secretary.....2138 North Illinois St., Indianapolis
William Bogie, Treasurer.....214 Main St., Vincennes
Date of next meeting: May 15-17, 1933.
Place of next meeting: Claypool Hotel, Indianapolis.

IOWA

H. D. Coy, President.....Hamburg
John Scholten, Secretary.....810 Dows Building, Cedar Rapids
Frank Fourt, Treasurer.....Fairfield
Date of next meeting: May 2-4, 1933.
Place of next meeting: Fort Des Moines Hotel, Des Moines.

KANSAS

Clifford P. Elder, President.....Atchison
Fred A. Richmond, Secretary.....305 Federal Reserve Life Bldg., Kansas City
W. T. Triplett, Treasurer.....Salina
Date of next meeting: April 24-26, 1933.
Place of next meeting: Topeka.

KENTUCKY

Fred A. Millard, President.....Louisa
J. H. Fullenwider, Secretary-Treasurer.....1101 Heyburn Bldg., Louisville
Date of next meeting: April 3-5, 1933.
Place of next meeting: Brown Hotel, Louisville.

LOUISIANA

Charles P. Kelleher, President.....1009 American Bank Bldg., New Orleans
Julian S. Bernhard, Secretary.....417 Medical Arts Bldg., Shreveport
O. J. Ory, Treasurer.....Garyville
Date of next meeting:
Place of next meeting: New Orleans.

MAINE

Carl W. Maxfield, President.....Bangor
William D. Taylor, Secretary.....Mechanic Falls
D. S. Roberts, Treasurer.....655 Congress St., Portland
Date of next meeting: June 22-24, 1933.
Place of next meeting: Rangeley Lake House, Rangeley Lake.

MARYLAND

Vernon B. Ames, President.....1408 Eutaw Place, Baltimore
Walter L. Oggesen, Secretary.....St. Paul & 23rd Sts., Baltimore
Walter E. Green, Treasurer.....2958 W. North Ave., Baltimore
Date of next meeting: May 1-4, 1933.
Place of next meeting: Baltimore.

MASSACHUSETTS

Walter J. Bryans, President.....97 Main St., Lee
Philip E. Adams, Secretary.....236 Newbury St., Boston
Joseph T. Paul, Treasurer.....419 Boylston St., Boston
Date of next meeting: May 1-4, 1933.
Place of next meeting: Hotel Statler, Boston.

MICHIGAN

Ward Moore, President.....1426 G. R. Nat'l Bank Bldg., Grand Rapids
William R. Davis, Secretary.....Michigan Department of Health, Lansing
E. J. Chamberlin, Treasurer.....519 Ashton Bldg., Grand Rapids
Date of next meeting: April 10-12.
Place of next meeting: Civic Auditorium, Grand Rapids.

MINNESOTA

C. O. Flagstad, President.....1549 Medical Arts Bldg., Minneapolis
L. M. Cruttenden, Secretary.....435 Hamm Bldg., St. Paul
A. R. Schmid, Treasurer.....Worthington
Date of next meeting: Feb. 7-9, 1933.
Place of next meeting: Auditorium, Minneapolis.

MISSISSIPPI

A. S. Hopkins, President.....Gulfport
M. L. Jones, Secretary-Treasurer.....Meridian
Date of next meeting:
Place of next meeting: Gulfport.

MISSOURI

Frank O. Rodgers, President.....Missouri Theatre Bldg., St. Louis
C. W. Digges, Secretary.....Columbia
James F. McLellan, Treasurer.....Moberly
Date of next meeting: May 15-17, 1933.
Place of next meeting: Hotel Jefferson, St. Louis.

MONTANA

W. M. Smart, President.....Miles City
J. E. Buehler, Secretary-Treasurer.....409 Ford Bldg., Great Falls
Date of next meeting: April 20-22, 1933.
Place of next meeting: Billings.

NEBRASKA

R. W. Ludwick, President.....1014 Federal Trust Bldg., Lincoln
F. A. Pierson, Secretary.....1014 Federal Trust Bldg., Lincoln
G. L. Spencer, Treasurer.....Sharp Bldg., Lincoln
Date of next meeting: May 15-18, 1933.
Place of next meeting: Omaha.

NEVADA

L. M. Nelson, President.....Medico-Dental Bldg., Reno
P. H. Phillips, Secretary-Treasurer.....Medico-Dental Bldg., Reno
Date of next meeting: June 3, 1933.
Place of next meeting: Reno.

NEW HAMPSHIRE

R. H. Barnard, President.....Keene
W. J. Moyles, Secretary.....1061 Elm St., Manchester
W. A. Young, Treasurer.....Concord
Date of next meeting:
Place of next meeting:

NEW JERSEY

E. W. Roberts, President.....627 Haddon Ave., Collingswood
F. K. Heazelton, Secretary.....223 East Hanover St., Trenton
George H. Griffith, Treasurer.....42 West State St., Trenton
Date of next meeting: April 26-28, 1933.
Place of next meeting: Ambassador Hotel, Atlantic City.

NEW MEXICO

D. P. Nolting, President.....Albuquerque
Fred Muller, Secretary-Treasurer.....Taos
Date of next meeting:
Place of next meeting:

NEW YORK

Fred B. Howe, President.....411 Savings Bank Bldg., Ithaca
A. P. Burkhart, Secretary.....57 E. Genesee St., Auburn
George H. Butler, Treasurer.....Skaneateles
Date of next meeting: May 11-13, 1933.
Place of next meeting: Syracuse.

NORTH CAROLINA

Wilbert Jackson, President.....Clinton
D. L. Pridgen, Secretary-Treasurer.....Fayetteville
Date of next meeting: June 6-8, 1933.
Place of next meeting: University of North Carolina, Chapel Hill.

NORTH DAKOTA

L. I. Gilbert, President.....Fargo
W. S. Shaw, Secretary.....Edwards Bldg., Fargo
L. E. Musberger, Treasurer.....Jamestown
Date of next meeting:
Place of next meeting: Valley City.

OHIO

Alden J. Bush, President.....683 East Broad St., Columbus
Edward C. Mills, Secretary.....255 East Broad St., Columbus
Harry Cope, Treasurer.....327 East State St., Columbus
Date of next meeting:
Place of next meeting:

OKLAHOMA

A. C. Seids, President.....1200 N. Walker St., Oklahoma City
F. J. Reichmann, Secretary.....1205 Medical Arts Bldg., Oklahoma City
C. B. Ball, Treasurer.....Frederick
Date of next meeting: April 17-20, 1933.
Place of next meeting: Skirvin Hotel, Oklahoma City.

OREGON

J. Q. Young, President .....Medical-Dental Building, Portland
F. W. Hollister, Secretary-Treasurer.....Medical-Dental Building, Portland
Date of next meeting: June 21-24, 1933.
Place of next meeting: Portland.

PANAMA

Herbert Alden Doten, President.....Administration Bldg., Cristobal, C. Z.
Vern Prier, Secretary-Treasurer .....Masonic Temple Bldg., Cristobal, C. Z.
Date of next meeting: August, 1933.
Place of next meeting:

PENNSYLVANIA

George A. Coleman, President.....15th & Locust Sts., Philadelphia
C. W. Hagan, Secretary.....1011 Macon Avenue, Pittsburgh
J. A. Brady, Treasurer.....2108 N. Broad St., Philadelphia
Date of next meeting: May 2-4, 1933.
Place of next meeting: Philadelphia.

PUERTO RICO

Jose Vicente, President.....Box 100, San Juan
J. R. Hernandez Gonzales, Secretary.....Box 1361, San Juan
R. Fernandez Carballo, Treasurer.....Box 3291, Santruce
Date of next meeting:
Place of next meeting:

PHILIPPINE ISLANDS

Eladio R. Aldecoa, President.....1742 Rizal Ave., Manila
Hilario P. Perez, Secretary-Treasurer.....Dela Rama Bldg., Manila
Date of next meeting:
Place of next meeting:

RHODE ISLAND

Edward F. Gill, President.....681 Broadway, Providence
Charles J. Smith, Secretary.....146 Westminster Street, Providence
William J. McGovern, Treasurer.....830 Park Avenue, Auburn
Date of next meeting: Jan. 25-26, 1933.
Place of next meeting: Biltmore Hotel, Providence.

SOUTH CAROLINA

T. C. Sparks, President.....Medical Bldg., Columbia
N. W. Macaulay, Secretary.....1417 Hampton Ave., Columbia
Guy M. Meares, Treasurer.....1507 Main St., Columbia
Date of next meeting: May 22-23, 1933.
Place of next meeting: Columbia.

SOUTH DAKOTA

C. K. Walker, President.....Huron
E. W. Elmen, Secretary.....Sioux Falls
J. W. King, Treasurer.....Aberdeen
Date of next meeting: June, 1933.
Place of next meeting: Watertown.

TENNESSEE

R. P. Moss, President.....Kingsport
E. J. Justis, Secretary-Treasurer.....710 Exchange Bldg., Memphis
Date of next meeting: April 27-29, 1933.
Place of next meeting: Knoxville.

TEXAS

R. L. Rogers, President.....Amarillo
J. G. Fife, Secretary-Treasurer.....Medical Arts Bldg., Dallas
Date of next meeting: May 9-11, 1933.
Place of next meeting: San Antonio.

UTAH

A. W. Petty, President.....Ogden
William Wood, Secretary-Treasurer.....First Nat'l Bank Bldg., Salt Lake City
Date of next meeting: June 1-3, 1933.
Place of next meeting: Bigelow Hotel, Ogden.

VERMONT

Howard H. Reid, President ..... Barre
W. Fay Mann, Secretary ..... Barre
Thomas A. Norton, Treasurer ..... Rutland
Date of next meeting: May 17-19, 1933.
Place of next meeting: Hotel Van Ness, Burlington.

VIRGINIA

W. H. Street, President ..... Medical Arts Bldg., Richmond
A. M. Wash, Secretary-Treasurer ..... Medical Arts Bldg., Richmond
Date of next meeting: April 24-26, 1933.
Place of next meeting: Richmond.

WASHINGTON

H. E. Wight, President ..... 423 Miller Bldg., Yakima
A. W. Jeffery, Secretary-Treasurer ..... 533 Medical & Dental Bldg., Seattle
Date of next meeting: June 30-July 2, 1933.
Place of next meeting: Yakima.

WEST VIRGINIA

C. L. Callaway, President ..... Beckley
J. E. Herbert, Secretary ..... Martinsburg
John S. Stone, Treasurer ..... Clarksburg
Date of meeting: May 15-17, 1933.
Place of next meeting: Charleston.

WISCONSIN

R. W. Huegel, President ..... 703 Tenney Block, Madison
E. E. Parkinson, Secretary ..... 104 King Street, Madison
H. S. Huxtable, Treasurer ..... 126 High St., Mineral Point
No annual meeting in 1933.

WYOMING

P. C. McNiff, President ..... Laramie
E. C. Andrew, Secretary ..... Cheyenne
Peter Appel, Jr., Treasurer ..... Cheyenne
Date of next meeting: June, 1933.
Place of next meeting: Laramie.

RECENT BOOKS WORTH BORROWING* OR BUYING† from the LIBRARY BUREAU of the AMERICAN DENTAL ASSOCIATION

212 E. Superior St., Chicago, Ill.

Bowler, Inez	Elementary manual of dental library practice. Ann Arbor, Univ. of Michigan Press, 1932.
Campbell, Menzies	Those teeth of yours. London, Heinemann, 1931. $1.50.
Casto, T. D.	Questions and answers on pedodontology, with glossary. Philadelphia, author, 1932. $2.50.
Churchill, H. R.	Human odontography and histology. Philadelphia, Lea & Febiger, 1932. $4.50.
Committee on Costs of Medical Care	Medical care for the American people. Chicago, Univ. of Chicago Press, 1932. $1.50.
Hewer, C. L.	Recent advances in anaesthesia and analgesia. Philadelphia, Blakiston, 1932. $3.50.
Smyth, Corisande, & Young, Matthew	Facial growth in children. London, His Majesty's Stationery Office, 1932. $.75.
Turner, C. R., & Anthony, L. P.	American textbook of prosthetic dentistry. Phliadelphia, Lea & Febiger, 1932. $10.00.
Urling, L. H.	Your teeth; their care and preservation. Philadelphia, Dorrance, 1932. $1.50.
Wolfenden, H. H.	Real meaning of social insurance. Toronto, Canada, Macmillan, 1932. $2.00.

ORTHODONTIA EDITORIAL REPRODUCED IN FORM SUITABLE FOR FRAMING

In response to numerous requests, the tribute to orthodontia which originally appeared as an editorial in THE JOURNAL has now been reprinted in a form suitable for framing, on parchment-like paper, measuring 10 by 15 inches. It is printed in brown and autographed in brown by the author. The initial letter is colored and may be obtained in green or red as preferred. The cost of each copy is 50 cents. Send your order and remittance to the Library Bureau of the American Dental Association, 212 E. Superior St., Chicago, Ill.

GIVE WRITTEN INSTRUCTIONS TO YOUR DENTURE PATIENTS

A booklet entitled "Your New Teeth," may be procured for distribution to your patients from the Library Bureau of the American Dental Association. This booklet is intended primarily for the patient who is wearing dentures for the first time. It enumerates some of the difficulties that may be encountered when one first wears dentures and offers suggestions as to how these difficulties may be overcome. There is also much of interest to the patient who has been wearing dentures, as information is given regarding the care, repair and rebasing of dentures. The information in this booklet was taken from the article entitled "Instructions for the Edentulous Patient," by B. L. Hooper, which was published in THE JOURNAL, February, 1932. The price of these booklets is: 25, $1.00; 50, $1.50; 100, $2.00. Kindly send remittance with order. A sample of booklet will be sent on request.

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*Books may be *borrowed* by members of the Association for a period of one week after date of receipt; and if not reserved for some one else, the period will be extended on request. A deposit of $2.00 for each volume to be sent at one time should accompany all requests for

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For comprehensive list of recent books see THE JOURNAL for September 1932.

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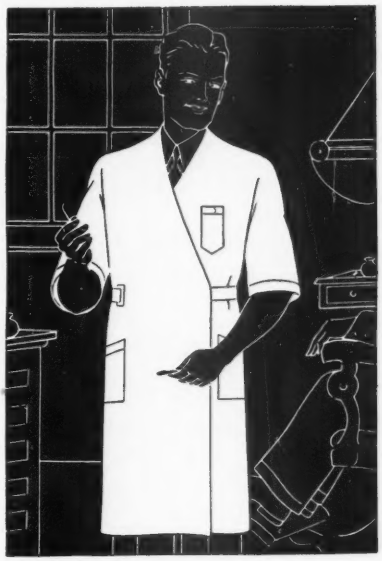

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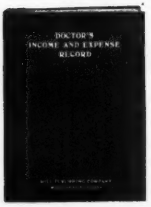

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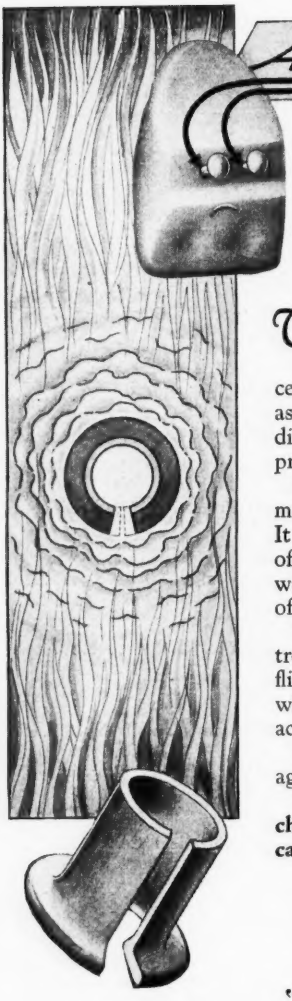

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